UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics

THE ECONOMIC POSITION OF THE WESTERN STATES IN AMERICAN AGRICULTURE

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My task is to give a general discussion of the agriculture of the eleven western States by tracing its development and sketching its present status. It is an attempt to bring out the more important economic problems and to identify at least some of the forces and conditions which are to shape its future development. Those concerned with shaping its policy, and those actually making up its agricultural population, must reckon with these forces and conditions if the agriculture of the region is to have a satisfactory and prosperous future.

No doubt the farmers and livestock men of this region have become conscious, along with those of other regions, of the fact that their business has been passing through a series of major changes during the last fifteen years. Probably they also have been, and still are, much in doubt as to the reasons for these changes and the significance of them. Nor are the farmers alone in this uncertainty. If we who are making our special task the studying and interpretation of the economic problems of agriculture were entirely clear as to their real nature, the results of our efforts would probably be distinctly more gratifying and of greater economic benefit to farmers. Baffling as these problems seem to be, and little as our progress may appear, it may help us occasionally to draw away from the immediate details of our work and to view its setting somewhat at a distance and thus in better perspective.

For this reason, I propose in the present discussion first briefly to trace the development of Western States agriculture through the past thirty years; second, to trace in more detail, and in terms of its leading farms and range enterprises, the rapid changes of the past fifteen years and to try to account for these changes; third, to attempt a look ahead in the light of present and prospective economic conditions and in the light of the nature of the land, climate, and other physical characteristics of the region, specifically in terms of its most important lines of agricultural production; and, finally, to discuss some of the more basic considerations, mainly of an economic nature, of importance to Western States agriculture and hence of importance to those who, in one way or another, have responsibility in shaping its future development.

THIRTY YEARS OF CHANGE IN WESTERN AGRICULTURE

The years 1900 to date have been selected for a general survey of Western States agriculture because this period marks the most fundamental and far-reaching changes in the utilization of the agricultural and pastoral resources in this region. It marks also the occurrence of certain events out of which have flowed and are still flowing far-reaching influences affecting not only the agriculture of this region but its relation to the agriculture of the country as a whole and of the world.

Some specific elements in this change may be mentioned. These years have marked the passing of the old-time range cattle industry and the substitution of a new, and in many respects, distinctly different program of animal husbandry for the region. As a counterpart of this movement we have the invasion of the homesteader into the old range territory, bringing with him sweeping changes in the tenure of grazing land, in the economy of livestock production, and in the intermingling of crop growing with animal husbandry activities. During this period alienation of the public domain to the extent of 244,082 square miles of territory, lying for the most part within the boundary of these eleven Western States, has taken place. An increase in the acreage devoted to crops of approximately 100 per cent has accompanied this expansion in the area of privately owned lands.

The foregoing changes have taken place mostly within the eastern two-thirds of this region in the territory formerly known as the "cattle country." Changes not so sweeping, but nevertheless important, have been taking place in the Coast States. There has been a further substantial increase in the intensive and extensive farming of these areas. The irrigated acreage has increased considerably. In the fruit industry the exploitative period of expansion ended and gave place to a better adjusted and more stable acreage and volume of output based on the most suitable varieties and the adjustment in the kinds of fruit grown to the most advantageous conditions of soil and climate.

Turning to the outside influences which have been impinging upon this territory, and which have been in large measure responsible for the internal changes, we may mention first the course of the general and agricultural price levels. During the first two-thirds of this period not only did we have a rapidly rising general price level, but a course of agricultural prices which, on the whole, was rising more rapidly than were general commodity prices. This had the effect of placing agricultural producers in a position of growing advantage as compared with other producers. The result was to stimulate agricultural production, to push agricultural development into new territories, and to intensify the use of land already in farms. This movement was culminated by the phenomenal increase in prices resulting from the World War and our participation in it. During the first part of this boom period agricultural prices continued to gain upon non-agricultural prices. However, near the peak of the cycle this relation was reversed, agricultural prices dropped faster and farther than those of non-agricultural commodities and have remained relatively much lower during the agricultural depression that has characterized the last third of the period.

Accompanying these changes in the price level we have had a steady growth of population which has tended to broaden the market for agricultural commodities and which was largely responsible for the relatively prosperous times from 1900 to 1920, but which failed to restore agricultural prosperity in the past ten years.

The outstanding event for this whole period from the point of view of its far-reaching influences on the agriculture was the World War. Not all of the factors that have been at work in the recent and present agricultural situation are attributable to this catastrophe, but it is undeniable that agriculture was most profoundly influenced by the war.

The first and most obvious effect of the European war as it concerns American agriculture was to reduce the purchasing power of industrial Europe which previously had furnished an important outlet for the surplus agricultural products of this country. The second and perhaps more lasting effect of the war, so far as its influence on our agriculture is concerned, is the agricultural policy developed by the European countries primarily as an outcome of the war and its effects. Nearly all of these nations have settled upon a policy of self-sufficiency with reference to food production. They have sought to encourage agriculture by special aid and by protection such as tariffs and embargoes which have seriously hampered our export trade and have undoubtedly reduced foreign purchases of American farm products below the volume that would have been realized even in view of the reduced purchasing power of the industrial portions of the European population. We shall have occasion to cite some of the more specific effects of these conditions as we discuss in detail certain elements of western agriculture.

To trace some of these changes just cited in more detail let us resort to graphic presentation. Figure 1 is designed to show the changes in Western States agriculture in terms of crop and livestock enterprises. There has been a consistent, although not entirely steady, upward trend in the amount of land in farms. This, of course, is one of the manifestations of the homestead movement and the tendency to supplant the pastoral regime with an agricultural one. The trend of increase in crop acreage has not been anything like as great as that of land in farms. This means that the conversion of the public range to privately owned land has not been accompanied by anything like a corresponding transition in the mode of utilization.

Glancing a moment at the curves representing livestock, we note that although for the last few years sheep have been increasing rapidly in number, the general trend in their numbers has been downward. On the other hand, in spite of the fact that the number of cattle has been decreasing in the late years, the trend in cattle numbers for the period as a whole has been upward. This would seem to indicate that, on the whole, there has been a more complete utilization of livestock growing resources with

the change from public to private ownership of land. This, however, is probably due to the more systematic use of the grazing resources on the Forest Reserves and the greater production of supplementary feeds rather than to any better utilization of range land, as such, under private ownership.

Figure 2 shows where these changes have been taking place. It indicates the increase in acreage of harvested crops between the years 1909 and 1924. If we had detailed information for last year, such as the 1930 Census will make available, we would probably see a considerably greater change; since the increase in several of these regions would be shown to have gone a long way in the last five years. In general it is to be noted that this increase has taken place in the areas of comparatively level land suitable for the most modern and efficient methods of dry farming. Northeastern Montana and northeastern Colorado are the two outstanding areas of expansion. Perhaps within another ten years northeastern New Mexico will show a similar increase. Increases outside this Great Plains belt for the most part represent an expanded utilization of land under irrigation. It is significant that the dry-farming territory in the Pacific Northwest shows expansion in only a very few counties. Figures on the total amount of land in crops show that, in spite of the heavy increase in the newer agricultural areas of this region, the heaviest utilization is still to be found in the older sections represented by the Sacramento, San Joaquin, and Willamette Valleys and the Palouse Country.

Changes in the price level are graphically depicted in Figure 3. It is not surprising that under the stimulus of this price movement we had the rapid expansion in agricultural output which resulted from the expansion in acreage already noted. It is to be remembered that expansion was going on during these same years not only in parts of this country but in foreign countries, conspicuously so within the territory of our near neighbor to the north. The big stimulus in production came in the war years and shortly thereafter. Since that time there have been both contraction and expansion with the net result as already noted.

It is interesting to trace out the way in which the country and the agricultural public responded to this price stimulus. Demand for new lands was one of the most conspicuous manifestations in the first decade of this period. From 1900 to 1910 there was a heavy migration from the upper Mississippi Valley to the western Canadian provinces. Simultaneously there was growing pressure on the Government to release for settlement new tracts of land taken from Indian reservations. If time permitted, a most absorbing story could be told of the opening for settlement of tract after tract from the reservations of the two Dakotas, Montana, and other Western States. Some reflection of this movement can be seen in Figure 4 which shows the alienation of public domain during the period, in terms of original and final entries of land by private individuals. The figures upon which this chart is based exclude oil leases, mineral lands, and other grants; they thus represent as nearly as can be the results of land hunger on the part of those either directly or indirectly interested in agriculture and animal production.

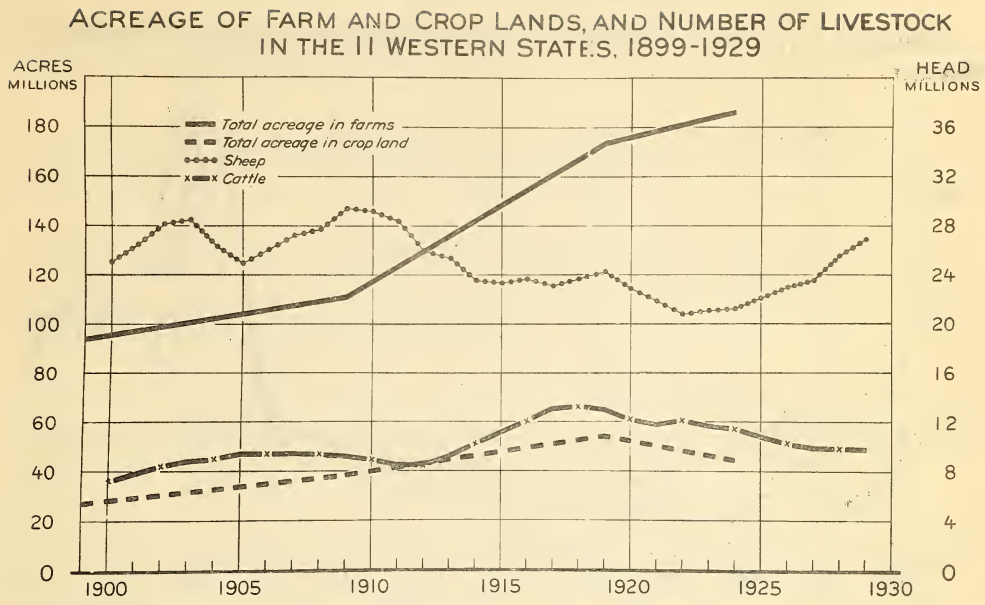

FIGURE 1 - THIS CHART MEASURES CHANGES IN THE AGRICULTURE OF THE WESTERN STATES DURING THE LAST 30 YEARS IN TERMS OF SHIFT IN LAND UTILIZATION AND NUMBER OF SHEEP AND CATTLE. INCREASE IN ACREAGE IN FARMS HAS OUTRUN INCREASE IN ACREAGE IN CROP LAND AND THERE HAS BEEN A DOWNWARD TREND IN NUMBER OF SHEEP AND A SLIGHT UPWARD TREND IN NUMBER OF CATTLE

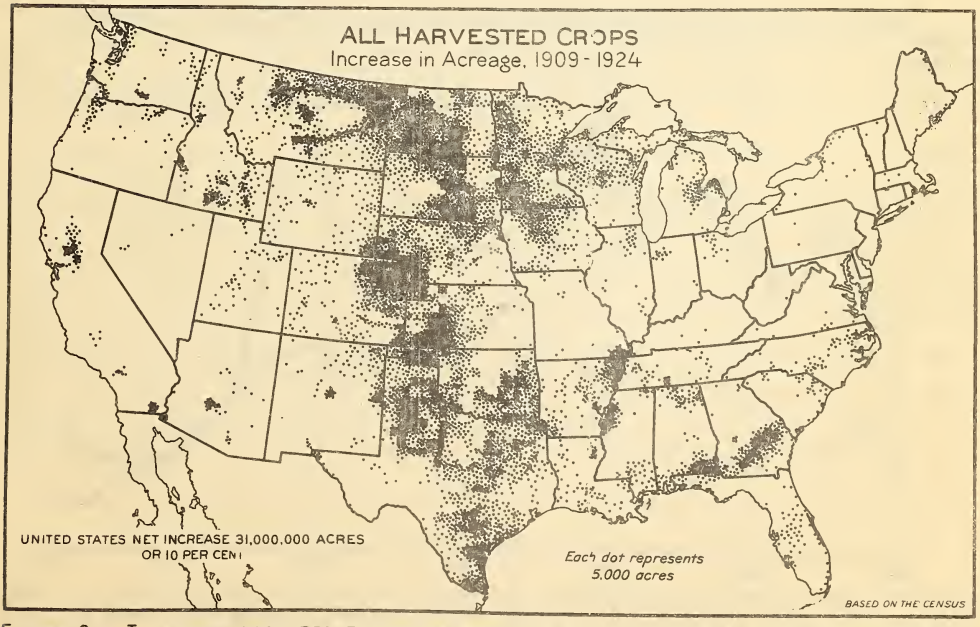

FIGURE 2 - THIS MAP INDICATES THE GEOGRAPHIC DISTRIBUTION OF THE INCREASE IN CROP ACREAGE SHOWN IN THE PREVIOUS FIGURE. IT HAS TAKEN PLACE MOSTLY IN THE AREAS OF EXTENSIVE DRY FARMING AND HAS COME PRIMARILY AS A RESULT OF THE DEVELOPMENT OF NEW FARM PRACTICE AND NEW FARM MACHINERY

INDEXES OF FARM PRODUCT AND NONAGRICULTURAL PRICES

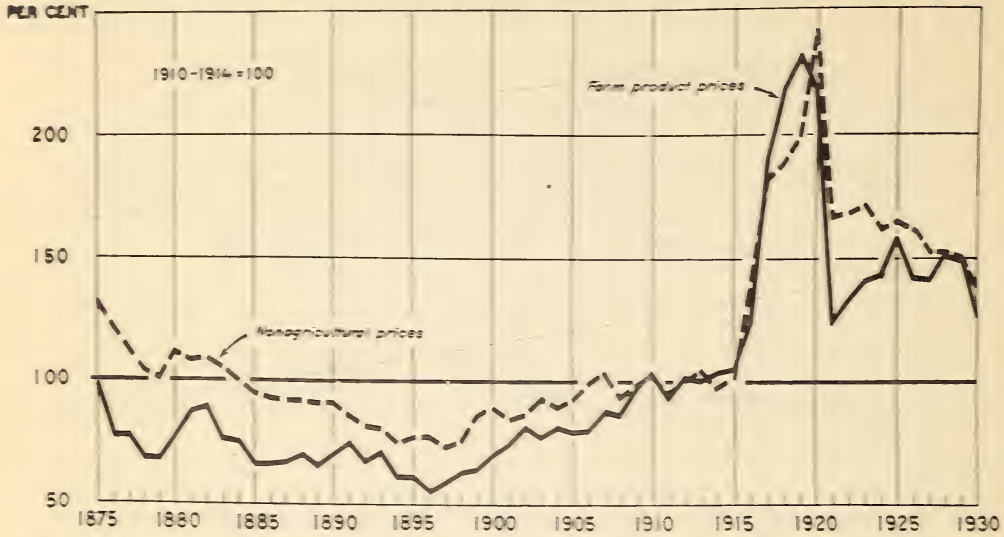

FIGURE 3 - CHANGES IN AGRICULTURE ARE THE RESULT OF ECONOMIC PRESSURE. EXPANSION IN WESTERN AGRICULTURE IN THE FIRST 20 YEARS WAS CAUSED PRIMARILY BY AN IMPROVING RATIO BETWEEN PRICES OF AGRICULTURAL PRODUCTS AND THOSE OF NONAGRICULTURAL COMMODITIES. EXPANSION OF THE LAST TEN YEARS IS DUE PRIMARILY TO REDUCED PRODUCTION COSTS THROUGH DEVELOPMENT OF AGRICULTURAL TECHNIQUE

PUBLIC LANDS ENTERED FOR AGRICULTURAL PURPOSES, 1900-1929

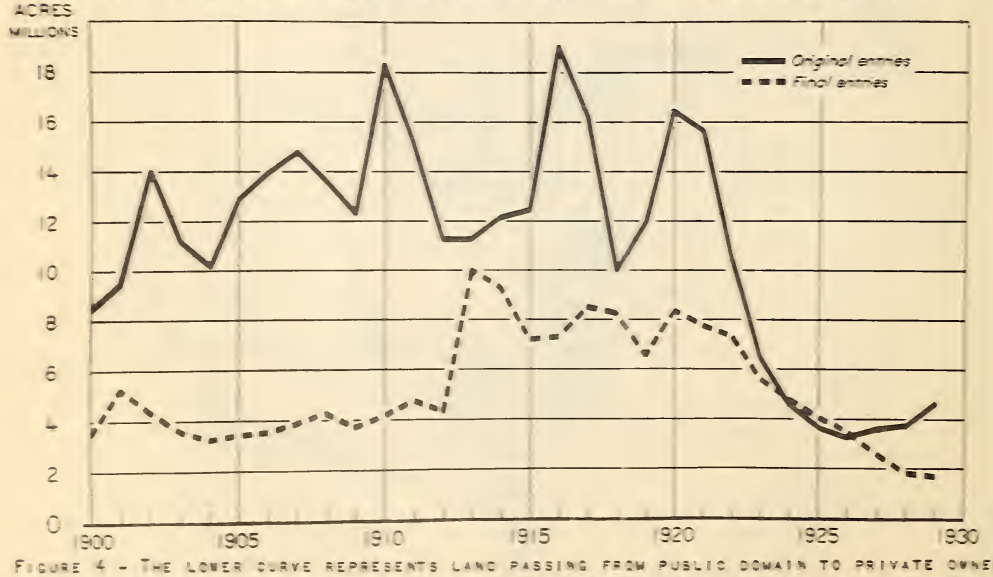

FIGURE 4 - THE LOWER CURVE REPRESENTS LAND PASSING FROM PUBLIC DOMAIN TO PRIVATE OWNERSHIP BY FINAL PROOF AND GOVERNMENT PATENT. MANY ORIGINAL ENTRIES WERE NEVER CARRIED THROUGH. SUCH LAND WAS FREQUENTLY REENTERED BY OTHER PARTIES. THERE IS A LAG OF FROM 14 MONTHS TO 5 YEARS BETWEEN THE ORIGINAL AND FINAL ENTRY IN THE CASE OF EACH PIECE OF LAND

You will note the cycles, or periods of peack demand for land as reflected in the curve representing original entries. Note particularly the rise following 1913. This was the result of the passage of the 320-acre Homestead Act. This necessitated a survey of the land suitable for filing under this act by the Geological Survey of the Federal Government; by 1921, 193,000,000 acres were designated under this survey as suitable but less than 2½ millions had been entered under it. 1/

The last peak was occasioned by the passage of the Stock Raising Homestead Act in 1916. Up to 1923, 31.4 million acres had been entered under this act. 2/

The declining rate at which these entries have been made during the last 10 years reflects the exhaustion of the supply of government land of a quality which, under the most optimistic view of agricultural land utilization, could be considered fit for farming.

Last, but by no means least, of the influences affecting western agriculture, particularly in the latter part of this period, is the rapid development of farm technique. This includes two closely related developments. The first involves the working out of methods or farm practices in terms of improved tillage processes and lower costs in crop production, and better methods of handling livestock. The other development has to do with the remarkable revolution in the type of farm machinery, made available during these few years, which is particularly adaptable to large-scale operations in the newly cultivated lands of this region. But little need be said about this subject since the far-reaching significance of this development is perhaps obvious to everyone.

STATUS OF THE LEADING FARM ENTERPRISES

With the foregoing sketch of the general course of change in the agriculture of the Western States in mind, let us turn our attention to a more minute examination of the important farm commodities. We shall take first the leading crops and groups of crops and then discuss the livestock industry.

In this treatment the effort will be to trace the development of these enterprises and, so far as possible, to point out the causes for their development and to present their present status in Western States agriculture. We shall also seek to determine, so far as possible, the relation of each enterprise as it stands in this region to the same lines of production in other areas at home and abroad: that is, we shall seek to determine the competitive advantages and disadvantages of the producers in this region as compared with those elsewhere. This is a large assignment and my limited knowledge of Western States agriculture fits me but poorly to do justice to it.

1/ Hibbard, "A History of the Public Land Policies," page 393.
2/ Op. cit.

Let us observe some general considerations with reference to the agriculture of this region, particularly with reference to its place in the crop and livestock production of the country. It has a total crop area, according to the estimates for the year 1929, of 33,260,000 acres; or 9-1/3 per cent of the total for the United States. The gross value of its crop production for 1928, the last year for which the figures are available, was $1,281,366,000, or 13 per cent of the total for the United States. The gross value of the livestock products for the same year was $763,050,000, or 12.3 per cent of the United States total. Its crops ranged from the most extensive, represented by wheat production under dry farming conditions, to the most intensive production of fruits and vegetables under irrigation.

Wheat

We pass now to a discussion of the leading considerations with reference to the specific crops. We begin with wheat; which is the most important crop of the region in terms of acreage and as a source of direct cash income.

The estimated acreage of wheat for the eleven Western States for the year 1929 was 11.6 millions, or 19 per cent of the total domestic acreage. This comprised all varieties of wheat, including Durum, made up both of winter and spring sowing. The total production for the year approximated 180 million bushels, or between 20 and 25 per cent of the total domestic production.

The crop shows a marked upward trend in acreage as shown by Figure 5. The acreage just indicated for 1929 represents a 33 per cent increase over the acreage four years previous, and a 23 per cent increase over the large crop of 1919, which marked the results of war-time conditions, with a guaranteed price and the patriotic appeal. As compared with the acreage of these States in the year 1909 the twenty year interval marks an increase of 154.5 per cent. This stands against an increase for the country as a whole of 20 per cent over 1924 and 38 per cent over 1909, while the country as a whole shows a decrease of 16.4 per cent from the crop of 1919. The substantial upward movement in the last five years has come in the face of declining prices.

More specifically, in terms of the changes in individual States, note that Montana has increased her wheat acreage in the last ten years by 145 per cent, while California has decreased hers in the same time by 37.4 per cent.

This wheat acreage divides itself into three rather distinct sub-regions. They may be pointed out by reference to Figure 6, which shows the distribution of wheat acreage for the country as a whole. The first of these sub-regions is that of the Pacific Northwest with an acreage of 4.5 millions. This represents a modest increase. In 1910 the acreage was 3.8 millions. It reached a low in 1916 of 3.4 millions, a high in 1919 of 5.6 millions, another low in 1924 of 3.9, and a new high in 1927 of 5.3 millions.

As to physical conditions affecting the production of wheat in this north-west area, we mark that the rainfall varies from approximately 14 to 22 inches in the Palouse area, which represents the oldest wheat-producing development of this area. Production here has been going on for approximately two generations. Here natural conditions are most favorable in regard to both soil and rainfall. The newer developments represent poorer land, particularly in terms of rainfall, and have to a large measure been brought in through the stimulus of new and more efficient machinery as well as the influence of higher prices at certain periods.

The situation of this area is unique with reference to market outlet. The long, expensive freight haul eastward to milling and consuming centers presents a barrier of approximately twelve cents per bushel as compared with similar varieties of North Dakota wheat. This condition results in forcing the bulk of the production of this area upon the export market. It will probably continue to be an export area for an indefinite period. This places the producers of the region upon a world market basis in a somewhat more definite way than is true in the hard red spring wheat area to the eastward.

The next sub-region is that of the hard red spring area represented primarily by Montana. This area raises a considerable amount of winter wheat, but spring wheat predominates, and its quality and grade compare favorably with that produced in the Red River Valley. Indeed, this subregion (fig. 6) is merely a westward extension of the main spring wheat area of the country. Its acreage, so far as the Western States region is concerned, is about 4.4 millions as represented by the figures of 1929.

It has experienced a rapid rate of increase during the last few years. Here the effect of the new technique has been most manifest in increased acreage per man and reduced costs of production. On the other hand, the natural conditions of the area expose the producers to a maximum of hazards. This is accentuated by the fact that the bulk of the production is hard spring wheat, which throws the growing season into a period of the year when lack of rainfall is felt most critically by the growing crop. The wide range of annual rainfall makes crop production extremely uncertain and seasonal losses frequent and serious. However, expansion of production has gone on in this territory in the face of a declining price of wheat; which indicates that the experience of the growers has convinced them that wheat production one year with another can be made a paying enterprise. Furthermore, there seems to be some opportunity for further expansion. A rough calculation based upon the land classification tables of the Federal Geological Survey indicates that in the State of Montana alone it is physically possible to expand the wheat area by something like 800,000 acres, or 19 per cent of the 1929 production.

It should be pointed out that under normal conditions the wheat of this area is all needed for domestic milling and consumption. Its high protein content and other milling qualities characterize a small

enough quantity of our domestic production to insure for it whatever benefit may be derived from the wheat tariff. Although this has not been true during the past season, normally there is a considerable margin of advantage between the Minneapolis price of this wheat and the Winnepeg price of similar Canadian product.

The third sub-region is a western extension of the hard red winter wheat area whose center is located in western Kansas. As yet there has been nothing like the wheat acreage expansion in this part of the Western States that has been realized in Montana. Referring again to Figure 5, we note the location of it, most of which is to be found in Colorado. The 1924 distribution which is presented in Figure 6 is out of date. The 1929 figures show approximately 2 million acres of this wheat in the States of this region. Here again, there are vast possibilities for expansion. Probably so far as physical conditions are concerned the acreage could easily be doubled. The hazards created by natural conditions are something less in this area than in the spring wheat belt for the reason that the growing season for winter wheat enables the crop to take better advantage of rainfall and other weather conditions than is true of spring wheat.

This is a part of the great export surplus-producing area represented by the hard red winter wheat belt of the United States. This, together with the long freight hauls from the producing areas to the milling and export points, gives the area a distinct disadvantage as to price. Here, again, however, costs have been reduced to a minimum by the maximum advantage which has been taken of new machines and new methods of production which have characterized wheat growing in the newer territories both of this country and abroad during the last few years.

Up to this point we have been describing more or less the obvious conditions under which wheat is being produced in the Western States. It is well to turn our attention to the economic setting of this enterprise and to determine, so far as possible, its comparative advantage over the alternative uses of the land in the territory it occupies, as well as to inquire as best we may with reference to its competitive strength as compared with similar producing areas in this and other countries.

So far as alternative land uses are concerned over the most of this wheat territory it may be said that there are now practically no alternatives. That is to say, any other crop growing uses to which this land might be put are so far below wheat in their possibilities for returns that they are practically out of consideration. It has been suggested that forage crops might be substituted as a basis for livestock production. This runs into the double difficulty of reducing the acreage capacity of these farmers in the production of crops and of shifting them into lines of livestock production for which the market outlet is even narrower and more subject to violent price declines as a result of overproduction than is true of wheat. No other crop enables the farmer to handle so large an acreage and thus have so wide a basis for returns as does wheat. Further, in the production of no other crop available in this area is there opportunity to take similar advantage of new methods of production represented by the tractor, the combine, and the new tillage machinery.

This brings us to a consideration of what the new price situation, as it has developed during the last twelve months, means to the wheat producers of this region. If what we have just said is true it does not mean a shifting to other lines of production except in unusual situations. In fact, the farmers can not shift. They must either stay in or back out. That means that a reduction of wheat acreage is likely to come about only through the forcing out of groups of farmers least well situated as to quality of land and ability to produce at low costs. It would seem undoubtedly true that the rapid expansion of the last few years will receive a definite check.

The other side of this question has reference to the relative competitive strength of the wheat producers of this region as compared with those in other regions, particularly in foreign territory. In my own opinion the wheat producers of this country are at least as efficient, and are so situated as to produce wheat and put it on the market at as low a price, as are those of any other territory. Further, it seems entirely unreasonable to expect that the present extremely unfavorable prices are going to continue. What will happen here in the way of shearing off the marginal fringe of high-cost producers will undoubtedly happen in other countries, such as Canada, Australia, and Argentina. Further, it is not to be expected that the present world-wide business depression, which is probably a major factor in the present unsatisfactory wheat price situation, will continue indefinitely. It would seem, therefore, that the outcome of the present price situation will mean the complete shoving out of the game of some of the producers. It will mean, of course, lower profits, at least for a time, for all producers, including the best. It may well be expected to bring in large measure its own corrective in the way of an easing of the situation through a temporary reduction in volume and a better adjustment to world and domestic demand.

The present situation has certain lessons, it would seem, for the wheat producers of this region. In the first place, the period of the last ten years has been characterized by an excessive amount of obsolescence of wheat-producing machinery. It has been a period of rapid change in technique. With a fairly satisfactory price level these costs have been carried. This can not go on for the future. Wheat-producing methods must be stabilized on a lower cost basis and the rapid shift in method brought to a close. Wheat farmers can not afford to buy new outfits every other year.

In the second place, if farmers expect to avoid business failure they should exert great care in the extent to which they bid up land values to an over-capitalized level. In the third place, it would seem that these producers must form the habit of creating reserves, mainly financial reserves, to tide them over the bad years. Bad years come not only as a result of low prices, but as a result of low rainfall; and regardless of cause, receipts are likely to fall below expenditures to an embarrassing degree. Adequate reserves should be regarded as a necessity under these conditions.

I wish to venture two predictions with reference to the future of the wheat industry in this and other countries. The first is that wheat acreage is likely, in the long run, to increase in the newer portions of the country where conditions are favorable to its production under modern methods and to decrease in the older areas where there are more weeds and more alternative opportunities. The second is that after the present disturbance with its rapid changes has somewhat subsided, we shall find wheat production somewhat more definitely adjusted to the world demand for wheat at a permanently lower price level with relation to most other agricultural and non-agricultural commodities than has characterized the situation during the last fifteen years.

Flax

In the foregoing discussion of wheat we have omitted one qualification to the general assertion that there are no available substitutes whose competitive advantage is likely to enable it to take a part of the acreage now occupied by wheat. Flax is this one exception. Its production requirements are so nearly similar in amount and seasonal distribution with those of wheat that they may fairly be said to be competing crops. The gross per-acre value of flax since 1920 has averaged about 25 per cent above that of wheat. Nevertheless, there has not been a great tendency for flax acreage to increase at the expense of wheat acreage. This indicates that flax production involves some tangible or intangible elements that make it relatively less desirable to the farmer in spite of its greater value. Chief of these seems to be the greater trouble from weeds when growing it on old land.

We have been studying the effects of changes in the ratio between flax and wheat prices (or rather, changes in ratio of gross acre values) in order to see how much of an additional stimulus a farmer must have to increase flax acreage. We found that in Montana, which is the one important flax State for this region, there is a greater response to favorable price changes on flax than in the other States - North Dakota, South Dakota, and Minnesota.

During the five-year period 1923-1927, the average annual supply of flaxseed, domestic and foreign, in the United States was 42,800,000 bushels, while the average crop was 23,240,000 bushels and the average flax acreage 2,860,000 with an average yield of 8.2 bushels per acre.

With this rate of production, and with our present requirements, we could increase flax acreage in this country by 81.5 per cent over the 1923-1927 average acreage, or 2-1/3 million acres, without putting ourselves upon an exportable surplus basis. This would be equivalent to 15.5 per cent of the 1923-1927 hard spring wheat acreage. Offhand, therefore, it would seem that here is an opportunity to increase the production of a commodity protected by the tariff and thus reduce somewhat the acreage of a low-priced product.

In considering the probable replacement of wheat with flax there are three things to consider: First, flax yields have ranged from 4.8 to 9.1 bushels per acre during the last ten years, which means that, given a good yield, domestic requirements could easily be exceeded by an acreage which had been calculated by using an average yield; second, a very marked ex-

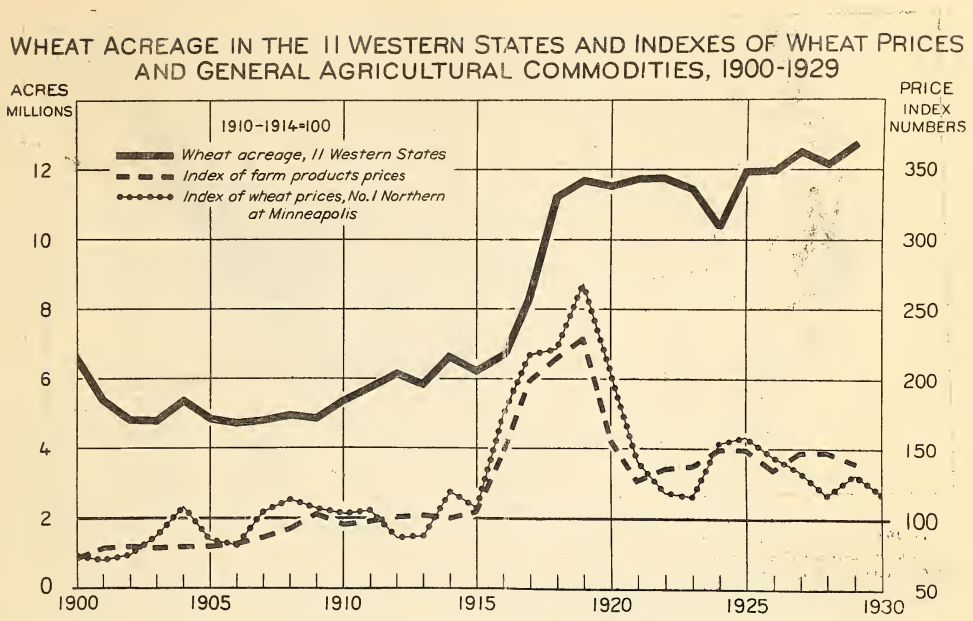

FIGURE 5 - THIS CHART SHOWS THE INFLUENCE OF NEW FARM PRACTICE ON WESTERN STATES IN WHEAT PRODUCTION. UP TO 1915 THERE WAS LITTLE INCREASE; THEN CAME THE RAPID INCREASE OF THE WORLD WAR PERIOD; THEN A TEMPORARY DECLINE; FOLLOWED BY RAPID INCREASES DURING THE LAST FIVE YEARS. IN THE LAST PART OF THE PERIOD PRICE RELATIONS WERE UNFAVORABLE TO WHEAT

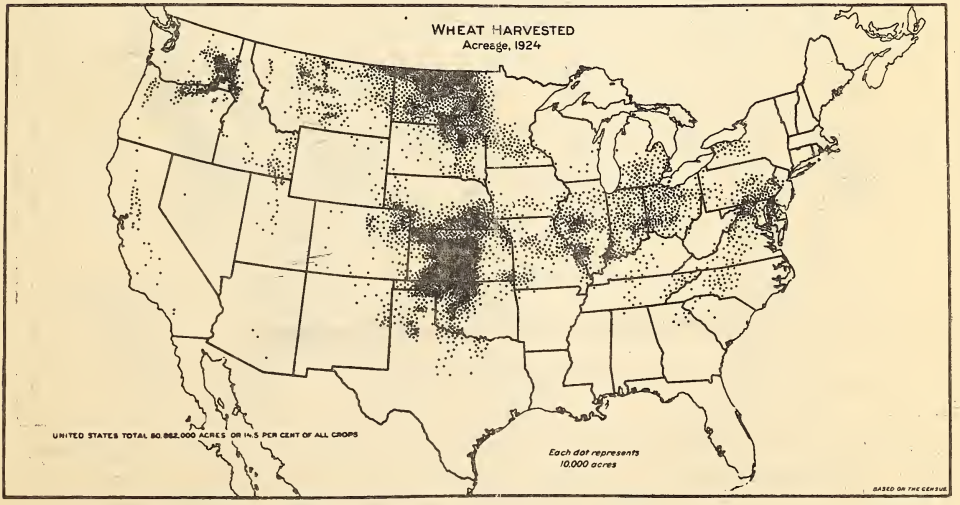

FIGURE 6 - NOTE FROM THIS MAP THE VARIOUS WHEAT AREAS IN THIS REGION. IN THE NORTHWEST AND IN SOUTHERN MONTANA BOTH WINTER AND SPRING WHEAT ARE GROWN

FIGURE 7 - FRUIT TREE DISTRIBUTION REFLECTS THE INFLUENCE OF ALTITUDE AND AN OCEAN-TEMPERATED CLIMATE. IRRIGATION ALSO FIGURES LARGELY IN THE LOCALIZATION OF FRUIT GROWING IN THE WESTERN STATES

FIGURE 8 - VEGETABLE GROWING IS A MINOR THOUGH EXPANDING FARM INDUSTRY WHICH, LIKE FRUIT, TENDS TO BE LOCALIZED UNDER ESPECIALLY FAVORABLE PHYSICAL CONDITIONS. IT IS IS CONFINED ALMOST WHOLLY TO THE IRRIGATED TRACTS

tension of flax acreage might well result in a decreased yield per acre; and third, increasing flax production would be expected to result in lowered prices and should domestic requirement drop below the level of the last four to six years, a weakened demand as well as an increased supply would tend to lower the price.

Under these conditions and with this outlook it is doubtful whether the substitution of flax for wheat to the extent indicated as possible will actually be feasible to the farmers and will materialize. Nevertheless, it is a matter worth serious consideration to the wheat growers of the northern portions of this region.

Fruit Crops

One of the older elements in the agriculture of the western region is the production of various fruits, particularly in the Pacific Coast States. Figure 7 presents the geographic distribution in terms of acreage of the nine principal fruits for the census year 1924. It shows clearly the heavy concentration of fruit production in the irrigated tracts and the humid valleys of the region. The localization of the various classes of fruits is primarily due to special favorable conditions in terms of temperature, air drainage, soil texture, and slope. To be sure, favorable conditions which are purely physical are not enough to localize permanently a fruit production development. Freight rates and perishability have contributed to the failure of a number of incipient developments.

Apples: This region has only 14.4 per cent of the apple trees of the country but it figures in almost as important a way in the domestic and world markets for apples as does all the remainder of the country. The enterprise is on a highly commercialized basis in this region with a maximum percentage of the output going into the channels of trade whereas for the rest of the country a very high percentage is produced for home consumption and fails to get into the trade.

Washington is of course the largest producer of apples in this region, its trees numbering 7 million, or over 38 per cent of those of the region in 1928. California has 4.5 million trees; Oregon 2.4 million, Idaho 1.6 million, and Colorado 1.2 millions.

There has been a decrease in number of apple trees of the country between 1909-28 of over 40 per cent. During this period the shrinkage in the 11 western States was 31 per cent. In spite of this drastic reduction in the number of trees the total production entering into trade has shown some increase. The increase in yield implied by this situation has resulted from a number of factors, chief among them being better cultural methods, the elimination of trees on areas unsuited for their protection, the elimination of undesirable varieties in the better areas, the coming into full bearing of young trees from previous heavy plantings accompanied by the abandonment of older and less productive orchards. All of these developments have been conspicuous in the apple industry of the western States.

It appears that the period of rapid and ill-considered planting came to an end at approximately 1919. Since then adjustments to the most favorable situations and to the best methods of production have been going steadily forward. Improvements in packing and marketing have been considerable. The trend of development is distinctly in the direction of a conservative policy as to planting. The rate has scarcely kept pace with the necessity for replacement. Nevertheless, it has probably been fast enough, considering the demand conditions. There is no occasion for a boom and evidently no great danger that one will develop. It may be said that western apples are more than holding their place in the eastern markets and in the export trade. This is indicated not only by the relative price that they command, but by the volume of marketings both in the domestic and export fields.

The following figures will give some indications of the growing importance of the export trade as an outlet for western apples. Approximately 15 per cent of the boxed apple crop of the United States was exported in the season 1929-30. This compares with 24 in 1928-29, 14 in 1927-28, and 18 in 1926-27. The principal markets to which American boxed apples are exported are, in order of their importance, Great Britain - which takes about half of our boxed apple exports - Germany, and other countries of north-western Europe. During recent years a fairly important trade in boxed apples has been developed with certain South American countries, particularly Argentina and Brazil.

Peaches: California is by far the leading western State in the production of peaches, reporting 13.2 millions of the 15.6 million peach trees of this area. They are to be found chiefly in the Sacramento and San Joaquin valleys. Other States that have developed somewhat in the peach industry are Colorado, Utah, and Washington, with approximately one-half a million trees each.

This Western States development represents only about 1/6 of the peach industry in the United States. There is, of course, a surplus over the demands of the Western States population. Some of this moves eastward in the form of fresh peaches, but the bulk of it is utilized in the canning industry. There has been a considerable amount of new planting during recent years and the output of this region is likely to increase in the near future. Earlier plantings in the eastern portion of the region occasioned losses to the growers because of their extremely disadvantageous position with reference to freight rates. It would seem that but little is to be done toward making western States agriculture more profitable by the expansion of the peach industry.

Grapes: Here, again, California leads with 280.6 million vines of the 284.6 million for the region as a whole. All three general varieties are to be found there; the juice grapes, raisin grapes, and table grapes. The growers of this crop have had serious difficulty during the past few years from overproduction and inability to expand the market beyond certain limits. The outlook for this industry seems dubious in view of the heavy plantings and the restricted demand.

Plums: Here, again, California registers with the major production, having 20.3 million trees out of the 28.5 millions for the region. This enterprise has increased steadily through a consistent growth for the last 20 years. In 1924 these Western States contained over three-fourths of the nation's plum and prune trees. Data are not available for the period since 1924 except for California, where a further expansion of approximately 3 per cent is indicated by the year 1932.

Between 40 and 50 per cent of the plum and prune output reaches an export market. Southern Europe, particularly Jugo Slavia, is the most important destination.

Citrus Fruit: Three classes of citrus fruits - oranges, lemons, and grape fruit - are grown in this region; or rather they are grown in California; the development is negligible in the other States.

Approximately three-fifths of the citrus acreage of the country is in California; most of the other two-fifths is located in Florida. The elements making for the relative competitive strength of these two regions are numerous and require more study than was possible in the present connection. Both territories have potential citrus lands in such acreages as to make the danger of overproduction always present. The wide variation in output due to seasonal difference in weather contribute to the hazard accompanying the production of these crops.

Oranges are by far the most important citrus fruit in the California belts. Florida produces 90 per cent of the grapefruit of the country, while California exceeds in oranges and produces practically all of the domestic lemons. In 1924 there were 15.8 million orange trees in the western region, 15.6 millions of which were to be found in California. In the same year there were 3.5 million lemon trees, practically all of which were in California. Out of a total of over 5 million grapefruit trees for the United States for the same year only 600,000 were to be found in the western region.

The outlook for the citrus industry is perhaps not better nor worse than that which characterizes the fruit industry as a whole. There is constantly the danger of overproduction. There is the wide range in the annual crop due to favorable and unfavorable seasons which effect wide swings in the price. The present plantings seem well adjusted to the natural conditions but there is the constant danger of new competition from the exploitation of new territory, particularly in Florida and the Gulf Coast.

Other fruit and nut crops of greater or less importance in the Western States are pears, pecans, and strawberries. In 1924 there were 10.6 million pear trees in the Western States, most of which were in California, Oregon, and Washington. There were also a few tens of thousands of pecan trees, although this industry is practically negligible in this territory. The strawberry enterprise occupied 23.3 million acres of land in this region in 192, which represents approximately one-eighth of the total acreage for the United States. It also represents an increase of 67 per cent over this region's acreage in 1909 and 86 per cent over the acreage in 1919.

Truck Crops

The estimated area of truck crops in 1929 for the eleven Western States totaled to 557,780 acres which was slightly over one-fifth of the estimated acreage of these crops for the country as a whole. Lettuce, cantaloupes, peas, tomatoes, and asparagus in the order named were the most important individual crops, occupying from 60,000 to 128,000 acres each. Eleven other truck crops occupied acreages running from 2,000 to 18,000 each.

Figure 8 showing the distribution of vegetable crops for the country for the year 1924 shows the localization of these crops in the western region. For the most part they are limited to irrigated tracts. Their localization is due primarily to special favorable conditions of soil and temperature. California again appears as the chief producer in this class of crops. It has shown a rapid increase in its acreage of practically all the vegetable crops to which its farmers are devoting attention. The growing population of the West Coast accounts in large measure for the increased importance of truck farming in this region. Nevertheless, a growing volume of fresh vegetables is moving eastward from this territory to the populous centers of the industrialized portions of the country.

Already this region is producing vastly more than its pro rata share of truck crops on the basis either of population or of total crop area. The phenomenal expansion apparently indicates special advantages in spite of the long haul to eastern markets. It should be kept in mind by those interested in this group of farm enterprises that there are far larger acreages of land that is ideally suited to truck crop production both in this area and in the other parts of the country than are needed to meet the present demand. As far as possible a balance must be preserved between demand and production. This is a difficult problem in view of the widely separated producing areas and the lack of centralized organization for the purpose of promulgating information and coordinating production effort. Under these conditions truck production will always carry large risks. There are, to be sure, unusually large returns in certain seasons. There is special need for very careful planning and the gauging of the volume of production in the light of prospective demand and prospective competition from other areas. The expectation is for a steadily increasingly demand for such products due to significant modifications in diet and the normal growth of population.

Potatoes

There is some specialized production of potatoes on the irrigated tracts of this region, more particularly in Idaho and Colorado, and there is minor commercial production in the humid valleys of the Northwest. Figure 9 presents the localization of this enterprise. The land devoted to this crop totals less than one-half million out of the 3.4 millions for the country as a whole. There has been a fairly rapid, though steady and probably rational, increase in this acreage, particularly in Idaho, where conditions seem to be most favorable. Potatoes produced on irrigated land apparently are of unusually high quality, commanding a distinct

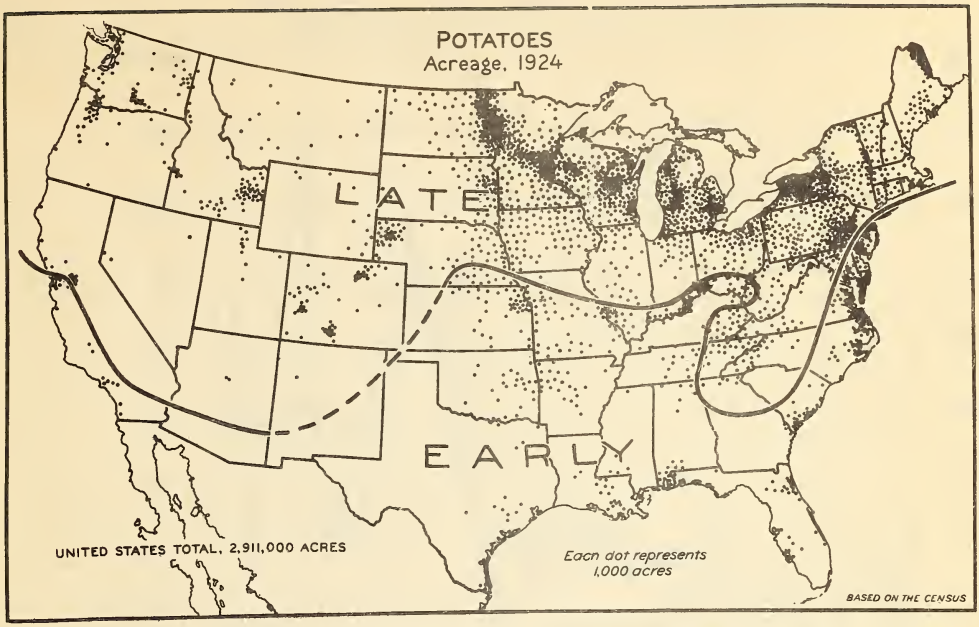

FIGURE 9 - POTATOES SEEM TO BE A COOL-AREA CROP IN THE WESTERN STATES. HIGH QUALITY AND HIGH YIELDS GIVE THE ENTERPRISE ITS COMPETITIVE STRENGTH IN AREAS WHERE IT IS FOUND

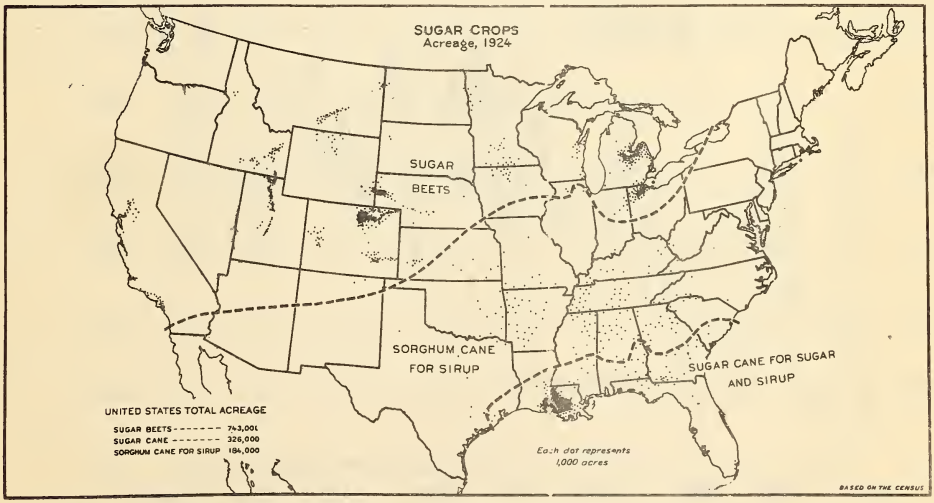

FIGURE 10 - SUGAR-BEET GROWING IS ANOTHER INTENSIVE ENTERPRISE, CONFINED IN THIS AREA WHOLLY TO IRRIGATED TRACTS. COLORADO AND UTAH HAVE LONG LED IN BEET PRODUCTION

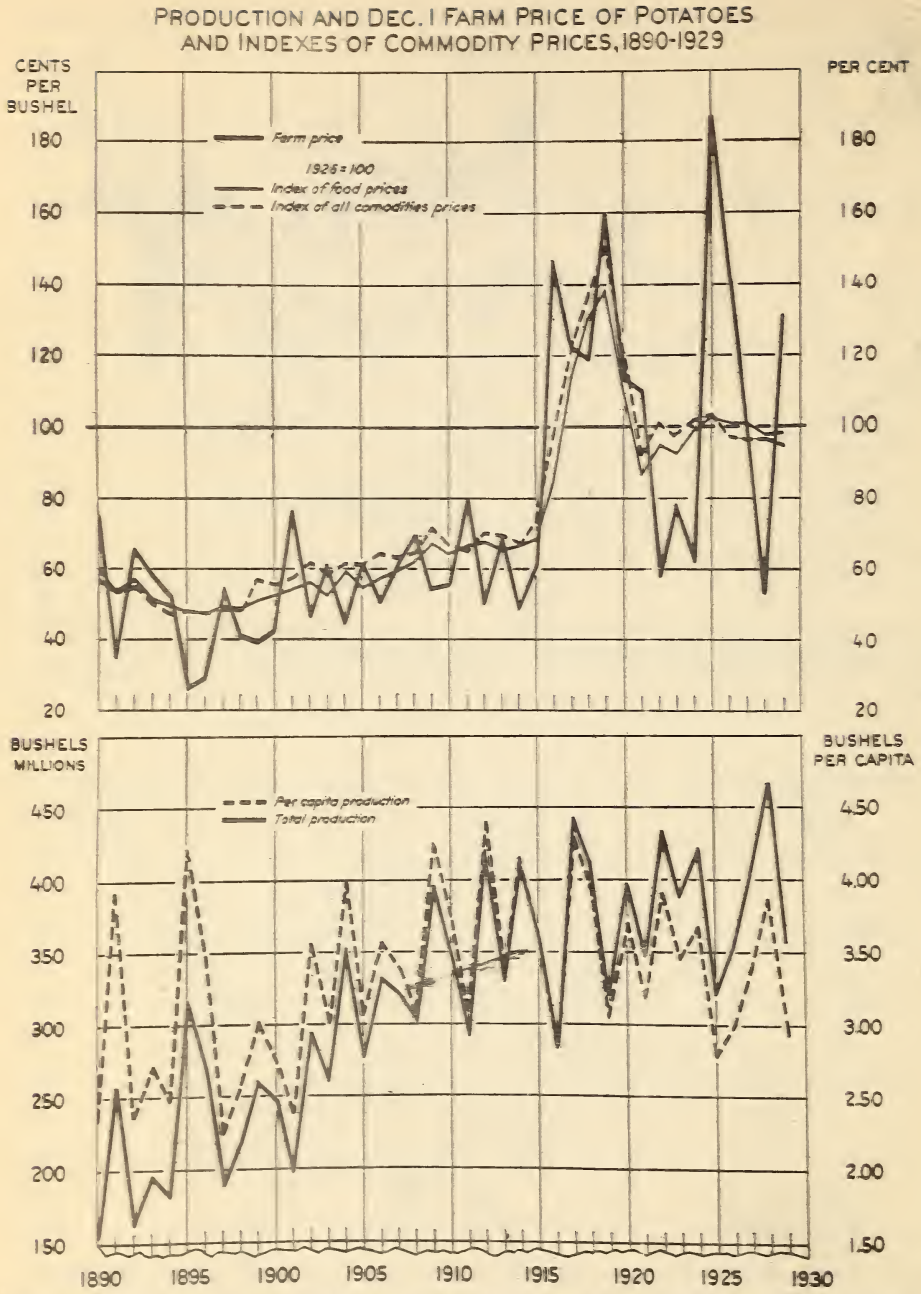

FIGURE 11 - VIOLENT YEAR-TO-YEAR FLUCTUATION CHARACTERIZES THE COURSE OF POTATO PRICES. THIS FLUCTUATION IS DUE ALMOST WHOLLY TO CHANGES IN SUPPLY AS A RESULT OF SHIFTS IN ACREAGE PLANTED AND TO YIELDS PER ACRE. POTATO PRODUCTION IS NOT KEEPING PACE WITH GROWTH IN POPULATION

premium over eastern grown potatoes. However, this premium narrows as the Western crop increases. There is, therefore, a definite danger from over-expansion of the industry.

Conditions in the potato situation as a whole are of interest to those farmers of this territory who are devoting their efforts to potatoe production. It is a product easily overdone and is subject to violent shifts in production because of the factors controlling acre yields as well as to over-and-under planting due to alternately high and low prices. However, the trend of potato prices has followed closely the trend in the general price level. There is evidence to show that the demand for potatoes is growing less rather than more elastic. That is to say, the effect of abnormally large crops in the reduction of prices is becoming more and more accentuated, probably because a larger variety of food products, to a limited degree at least, are taking the place of potatoes in the diet from other than pecuniary considerations. The outlet for potatoes is almost entirely a domestic one. Although the demand will expand with the normal increase in population the rate of expansion will be slow. Neither is there very much to be hoped from an increase in the manufacture of potatoes into starch and other products. This element in the present demand is almost negligible. Another item of interest to the potatoe producer is the recent development of the enterprise in the southeastern and south central States. The product from these new areas does not compete directly in a seasonal way with the potatoes of this region but they have some effect upon the market nevertheless.

Figure 11 indicates that potato production is not keeping pace with population growth in the United States. This is one indication of relative strength in the position of the enterprise. As compared with such crops as wheat and sugar, there are less evidences of overproduction of potatoes and a better price outlook.

Sugar Beets

Sugar beets constitute another crop that figures prominently in the irrigated sections of this region. For 1929 the estimated acreage for the region was 460,000, or 64 per cent of the total for the United States. Figure 10 shows the localization of these specialized areas.

As to trends in the acreage and production, figures indicate that the enterprise is fairly permanent in Colorado and Utah where it has shown a steady growth in acreage since 1909. Montana and Wyoming have shown a steady increase but on a small scale. Idaho, Washington, and California display diminishing acreages due probably to the ravages of beet diseases.

There is no doubt but that the enterprise throughout the area has felt the retarding effects of the low price of sugar due to recent expansion of cane production in this and other countries. A few facts on the national supply of sugar and the conditions under which it is produced and obtained are of interest to the sugar beet producer. We consume annually about 6 million tons of refined sugar. Of this we

produce 1.2 millions tons, or less than one-fourth. We bring in from our insular possessions annually about 2 million tons. We import the remainder mostly from Cuba, amounting to approximately three million tons. Of our domestic production about one million tons is from beets and the remainder from cane. Of the beet sugar produced in this country approximately two-thirds is in this region.

Figure 12 presents the course of sugar prices. We note the recent tendency toward lower levels, ending in the marked decline of the past year. This price curve reflects the effects of a series of developments which have had profound influence upon the sugar supply of the world during the last fifteen years. Prior to the World War the world was getting almost 40 per cent of its sugar supply from European sugar beet production. The World War greatly curtailed European beet production and limited the movement of its sugar within a very narrow range on the continent. The result was that the production of cane was greatly stimulated in all the tropical territory favorable to its growth. With the close of the war the rehabilitation of European agriculture began and it has gone forward with surprising rapidity. This has brought back into the world market a large proportion of the beet sugar output that characterized pre-war years. This, added to the increased output of cane sugar, has given rise to a condition of serious overproduction of sugar. A substantial increase in our domestic cane production, due primarily to the discovery and adaptation of new disease-resistant varieties, has added no little to the unfavorable situation. This would seem to mean that in spite of ample tariff protection so far as rates are concerned, the American sugar producer will encounter difficulties during the next few years until a readjustment of production to demand shall have taken place.

Feed Crops

Under feed crops are included, somewhat arbitrarily, hay, oats, corn, grain sorghums, barley, and rye. Figure 13 shows the course of change in the acreage of each of these crops from 1900 to date. In total, they occupy an area of 18,958,000 acres according to the estimates for 1929; or almost double that of the wheat acreage for these States. Practically 11.5 million acres of this total, or well over half of it, is hay; some of which acreage represents a very extensive use of land bearing an extremely light yield of feed. Barley and corn together, the chief concentrate feeds of the region, occupy approximately half as much area as wheat. Oats is fourth in the list with less than 200,000 acres and has been declining in acreage. Grain sorghums and rye are of minor importance, although having increased significantly during recent years. The acreage occupied by each of these feed crops in the period under review is shown in Figure 13.

Hay: Turning now to the individual feed crops for a more detailed discussion, we first consider hay. Of the acreage already cited, 2,219,000 represents wild hay acreage on most of which the yield per acre is light. According to the United States Department of Agriculture

estimates the average yield per acre in the eleven Western States from 1921 to 1925 was 1.01 tons, whereas tame hay, including alfalfa, had an average yield for the same period of tons. All tame hay, including alfalfa, had an estimated acreage in these States in the year 1929 of 9,275,000 almost equally divided between alfalfa and other tame hay; which latter included clover and timothy and clover mixtures. For the most part, this hay represents a feed resource used on the farms where it is grown or sold locally for the support of the local livestock enterprise. There is a considerable commercial movement of baled alfalfa hay to city markets within the area and to eastern points. No accurate measure exists as to the volume of this movement, but there is good reason to believe that it is declining in importance with decline in the number of horses in the eastern States, the growth of dairying, and changes in the methods of producing beef cattle.

Figure 14 presents the geographic distribution of the production of alfalfa. Here, again, is a crop which follows quite definitely the development of irrigation. It is an important crop in the humid portion of the Northwest and is of probably growing importance in certain dry-farming areas where a combination of crop and livestock production is developing. Its growth for seed is also increasing.

The marked increase in the tame hay acreage may be attributed to the following influences: First, the marked increase in dairy farming has increased the demand; second, the increase in sheep and the change toward more intensive feeding of sheep within the western region has increased the use of tame hay; third, with a growth in the cropping area generally alfalfa has been brought in as the most effective and practical legume crop to incorporate in the cropping systems; fourth, the modification of the production of beef cattle has demanded an increased acreage of alfalfa for its support; and fifth, with timothy hay less in demand as horses diminish in number, the price of timothy has declined relatively, thus stimulating further expansion in alfalfa.

Barley: Largely because of its adaptability to the climatic conditions generally existent in this region, barley is the most important concentrated feed crop. There has been a steady increase of its acreage in Montana, Idaho, Wyoming, and Oregon. Figure 15 indicates its distribution in 1924. A considerable portion of that grown in California has regularly found an export market. For the most part, however, the grain is grown as a feed for livestock.

As an element in the crop rotation, barley may be considered more definitely a competitor for oats than any other crop. It has the ascendency over oats in this region because it has shown a larger yield. The five-year average yield per acre for the region was 1,296 pounds of barley as compared with 1,024 pounds of oats. Add to this its superior feeding value for meat animals and we have ample explanation of its importance. One important factor is the growing tendency toward the fattening of cattle for the rapidly growing West Coast markets by means of a combination of alfalfa and barley. Barley has taken a place of rapidly increasing importance in the sheep fattening ration. There is some little tendency to extend the swine enterprise into this region and this has contributed somewhat to the stirulus for barley growing.

Corn is the next in importance as a concentrate feed crop in this region, its production being most conspicuous in the eastern portion, particularly in the central Great Plains. Colorado has over one-half of the acreage for the entire region. There has been a rapid increase in the corn acreage coming with the growth of the general crop acreage. This increase has not continued at its original pitch, however, inasmuch as the limitations of the region as to growing conditions have made themselves felt. As corn is a long-growing season crop and requires a large amount of moisture and does best in relatively high temperatures, it is peculiarly susceptible to the unfavorable climatic conditions of the region. These conditions are characterized by limited rainfall, a short growing season, and a daily temperature range unfavorable to the best growth of the corn plant. To a large extent it figures as a combination grain and roughage crop to supplement other feeds in the dairy ration.

Oats production, which amounted in 1909 to 1,820,000 acres, is mostly to be found in the northern portions of the region. It occupies a fairly important place in such territory as the Willamette Valley and has made some headway in the spring wheat portions, particularly in Montana.

Grain sorghums have come into the southwestern portion of this region within recent years as a rather significant source of concentrated feeds. Their acreage increased somewhat rapidly at first but during the last few years has shown some decline. The development seems not to have gone as rapidly as was expected.

This decline, or failure to fulfill expectations, is probably due in some degree to the rapid expansion of wheat acreage and the major attention which that crop has received during the last few years. When the need of more carefully worked out rotations in the winter wheat region becomes more apparent and particularly with the continued low price of wheat which it seems we may expect, it is altogether likely that considerably larger portions of the present cultivated area in this territory than is true at present will be devoted to these crops.

The foregoing presentation of the feed resources of the territory does not take into account one very important feed resource - pasture and grazing lands. This is a subject too broad to be treated in this paper. Its importance should not be minimized, however, for around it turn some of the most fundamental problems of the livestock industry of this region.

Livestock

The feeds discussed above have been increasing in quantity during the last fifteen years. This increase is creating a basis for a changed and expanding livestock industry.

Profound changes have taken place in this industry in the eleven Western States. At least two important influences were back of these changes. The first influence included the changes in the tenure of graz-

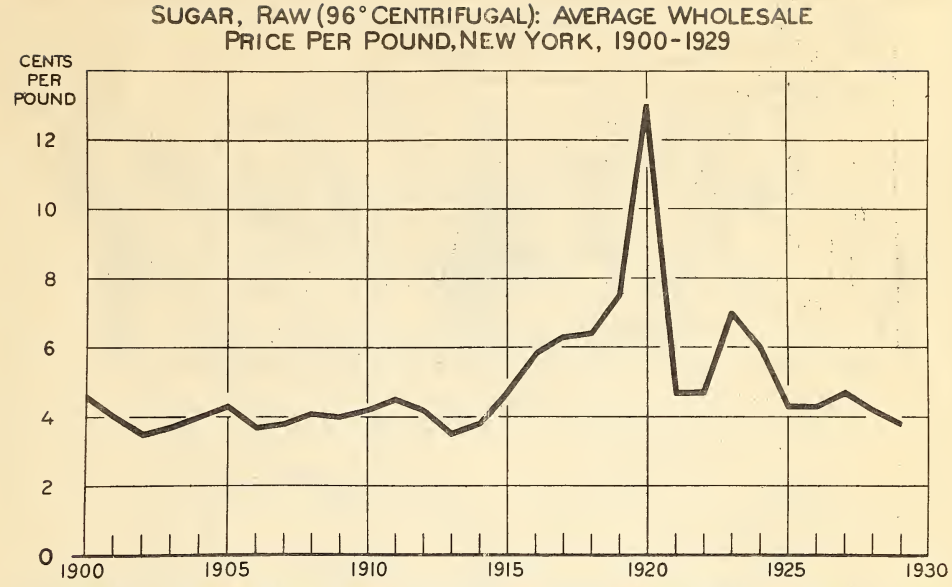

FIGURE 12 - THE WHOLESALE PRICE OF SUGAR WAS REMARKABLY STABLE FROM 1900 TO THE OUTBREAK OF THE WORLD WAR. THE POST-WAR TREND IS DISTINCTLY DOWNWARD

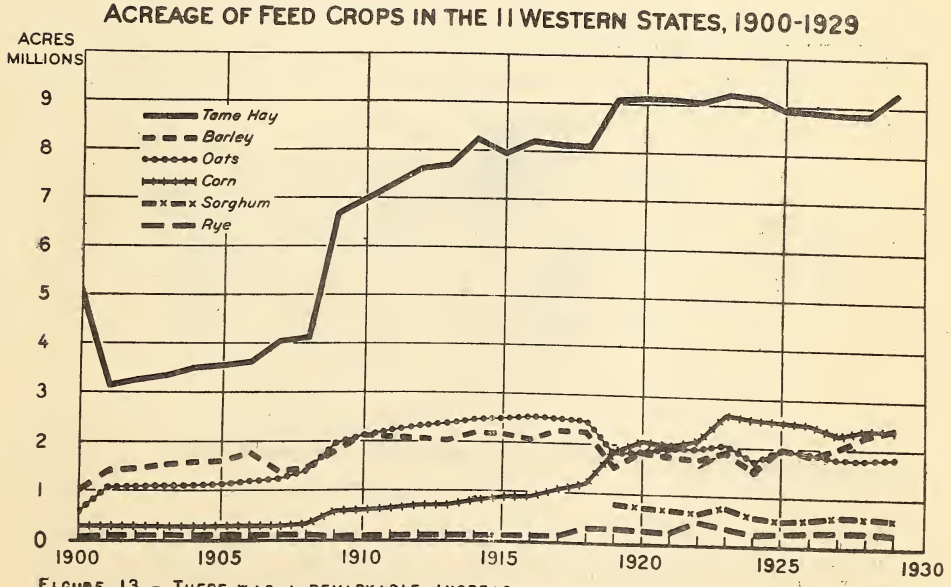

FIGURE 13 - THERE WAS A REMARKABLE INCREASE IN THE ACREAGE OF HAY IN THE WESTERN STATES BETWEEN 1908 AND 1919. ALMOST 90 PER CENT OF THIS TAME HAY ACREAGE IS NOW ALFALFA. CORN HAS COME TO BE AS IMPORTANT A CONCENTRATE FEED CROP IN THIS REGION - MEASURED BY ACREAGE - AS BARLEY

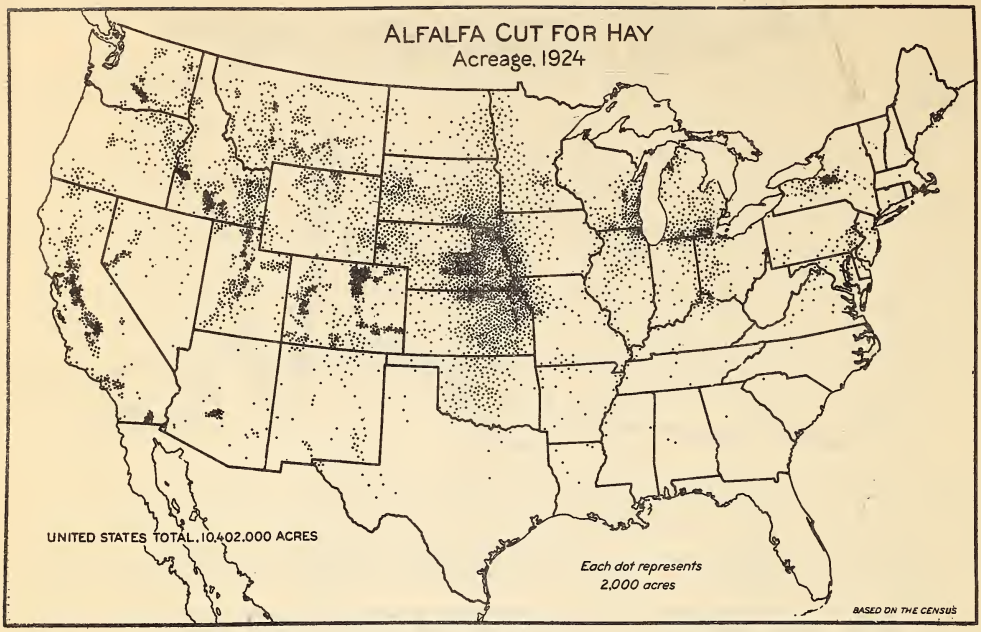

FIGURE 14 - DISTRIBUTION OF ALFALFA IN THIS REGION IS GENERAL, YET ALFALFA IS GROWN FOR THE MOST PART ON IRRIGATED LAND. IT IS COMING TO HAVE CONSIDERABLE PLACE IN DRY FARMING TERRITORY AS A SOURCE OF BOTH HAY AND SEED

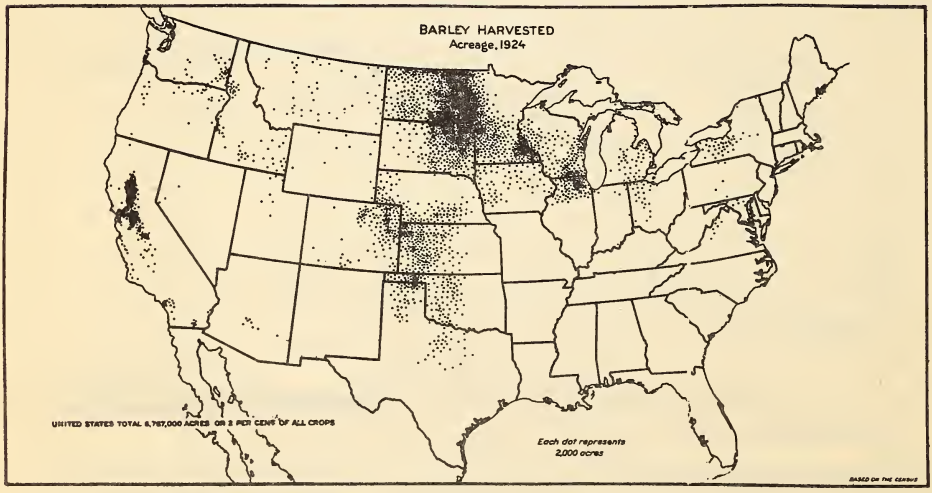

FIGURE 15 - THE BARLEY GROWN IN CALIFORNIA IS OF HIGH QUALITY AND MUCH OF IT IS EXPORTED FOR MALTING. ELSEWHERE IN THE REGION BARLEY IS GROWN ALMOST EXCLUSIVELY FOR FEED

ing land brought about by the invasion of the homesteader and the conversion of vast areas of the public domain from public ownership and use in common to private property and use in severalty either under ownership or rental. The second influence is, of course, an accompaniment of the first. It is the invasion of the grazing and range country by the agricultural industry as such. Other influences are at work, such as the development of non-agricultural industries in certain parts of the territory which has brought a substantial increase in the non-agricultural population creating new food demands and realigning the agriculture, particularly in the Pacific Coast States. This has been particularly manifest in its influence on the nature of the cattle industry, putting greater emphasis on dairying and changing the type and the production processes of cattle. It has also led to increasing emphasis on hog production. Likewise, it has changed to a considerable extent the nature of the sheep industry from much emphasis on wool to much emphasis on meat; which change has been accompanied on the whole by a downward trend in the number of sheep in the region.

Let us trace the nature and the effect of some of these changes.

The changes in the tenure of range land, accompanied by the establishment of forest reserves and the consumating of systems of grazing control within these reserves, have served to reduce the losses in range livestock production. They have done this first of all by inducing a greater amount of care in the growing of stock. Losses from storms have been reduced greatly through more care and more winter feeding which have resulted from the development of agriculture in and adjacent to range territory. This change has meant on the whole a greater total feed-producing utilization of the land. In many cases the carrying capacity of a given acreage has been increased many fold by the addition of labor and other expense incident to the substitution of cultivated crops for native range vegetation.

That there continue to be major problems in the utilization of grazing land is obvious. There is still a lack of control in the use of grazing land. Whereas formerly overstocking of the public ranges constituted a major problem, now the short and uncertain nature of tenure with which the ranchman is faced leads him to over-graze the holdings which he has this year but may not have next year. For the western grazing industry as a whole there is probably no more important problem than that of the tenure of grazing land.

Not only has the sheep industry changed, but cattle for meat are being grown in a different way. There is a larger amount of finishing because there are more people to be supplied with meat from animals produced wholly within this region. More and more the cattle of the ranges are being finished upon feeds produced in the area rather than upon Corn Belt feeds. Great market and slaughter centers have been established in our large Pacific Coast cities and the movement eastward is at least beginning to give way to a movement westward of cattle from the Great Plains and mountain grazing grounds. This is a significant movement and one which may well be watched by those interested in Western States livestock economy.

Not only has the coming of agriculture provided more feeds so as to change the process of cattle production, but the growing of these feeds takes a part of the rancher's time and thus reduces the size of the livestock production unit. The net result of these changes has been to increase the potential output and substantially to raise its quality.

All of these newer elements in the situation call for careful scrutiny of the whole livestock industry of the region and in many localities it would seem to call for a rather thorough-going reorganization and realignment of it; bringing it more definitely into adjustment to the changing market demand for livestock and livestock products on the one hand and to the changed conditions under which the utilization of the natural resources must be carried out on the other.

Let us now look with some detail into the evolution and present status of the various classes of livestock important in the region. Taking up first the meat animal industry we turn our attention to beef cattle. We want first to know what part this region plays in the beef cattle production of the country as a whole. For the period 1924 to 1928 the gross value of the annual production of cattle and calves for the United States as a whole was $1,012,417,000. For the Western States it was $173,725,000, or 17 per cent. We may get some notion as to the relative importance of this region as compared with the Corn Belt by noting that the North Central States, which includes not only the Corn Belt but the western dairy region, produced 50 per cent of this gross value. Another measure is the number of cattle on farms. On January 1, 1928 there were estimated to be for the United States as a whole 55,751,000 head of all cattle. In the Western States the corresponding estimate was 9,875,000, or 18.8 per cent of the total. For sheep the gross increase in value from 1924 to 1928 was, for the country as a whole, $153,192,000 and for the Western States $81,684,000, or 53 per cent. The number of sheep on farms in 1928 for the United States as a whole was estimated to be 47,171,000, whereas those in the Western States were estimated to be 26,722,000, or 56 per cent of the total. Thus it appears that while the Western States produce a rather minor fraction of the total beef supply of the United States it is decidedly a major factor in the sheep and wool situation.

Let us turn our attention now to the distribution and trends of livestock in this region from 1900 to 1930. The geographic distribution of cattle is indicated by Figure 16 which shows the situation for the year 1925, the date of the latest available census figures. There is a rather even distribution throughout this whole region.

Figure 17 similarly shows the distribution of sheep for the same year. Here we find a high degree of concentration in certain areas, reflecting favorable conditions with reference to feed. There are in general two contrasting situations. The first is that illustrated by the Sacramento Valley and certain heavily concentrated areas in Colorado and other States in the eastern portion of the region. These mark the feeding and finishing districts. The other areas of concentration are determined by grazing conditions particularly favorable to the growth of sheep.

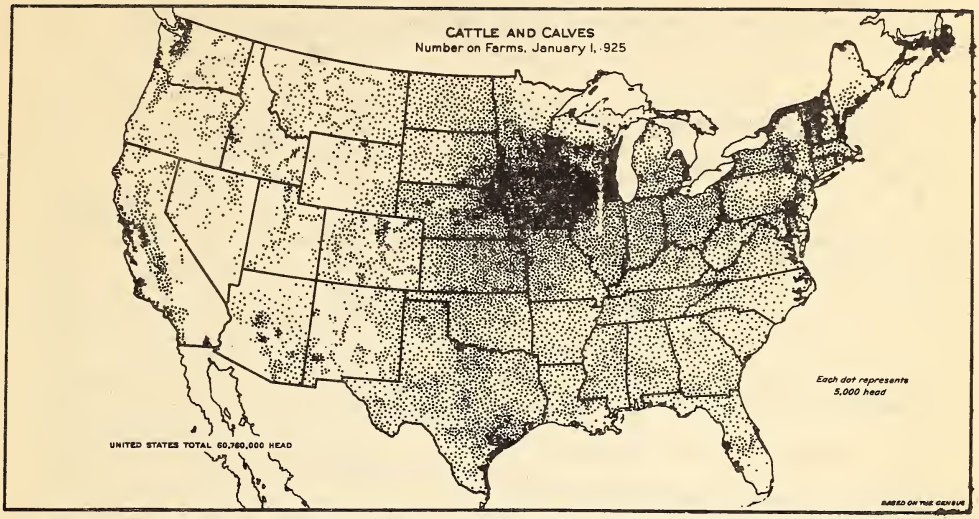

FIGURE 16 - CATTLE ARE TO BE FOUND FAIRLY EVENLY DISTRIBUTED OVER THE ENTIRE WESTERN REGION. THEY ARE AN IMPORTANT SOURCE OF FARM INCOME IN THE ARID, HUMID, AND IRRIGATED AREAS. THIS MAP SHOWS THE DISTRIBUTION OF BOTH BEEF AND DAIRY CATTLE

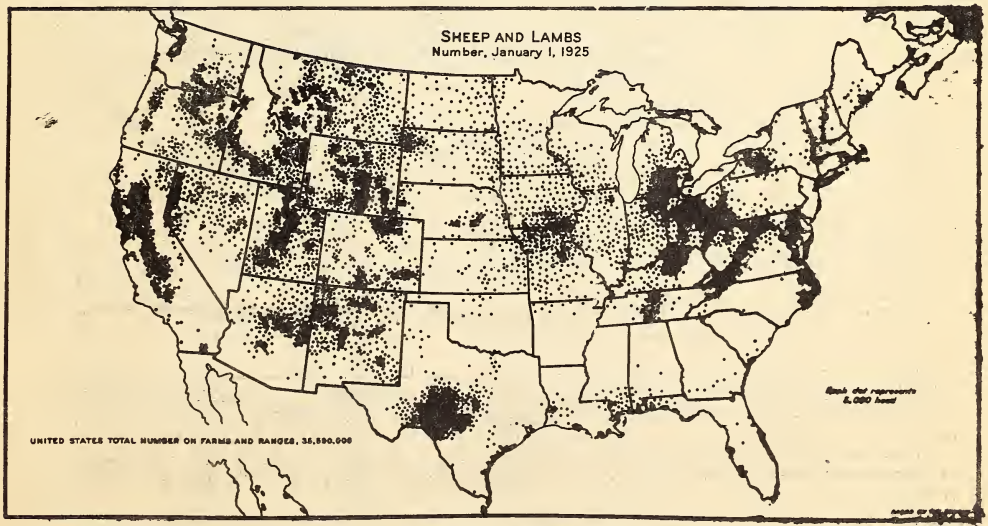

FIGURE 17 - SHEEP LOCALIZATION IS DETERMINED BY TWO TYPES OF FEED CONDITIONS: GRAZING AND INTENSIVE FEEDING. DURING THE 30 YEARS UNDER CONSIDERATION, THE AMOUNT OF SHEEP AND LAMB FEEDING IN THE REGION HAS GROWN REMARKABLY, ACCOMPANIED BY CONSIDERABLE SHIFT FROM WOOL TYPE TOWARD MUTTON TYPE BREEDS

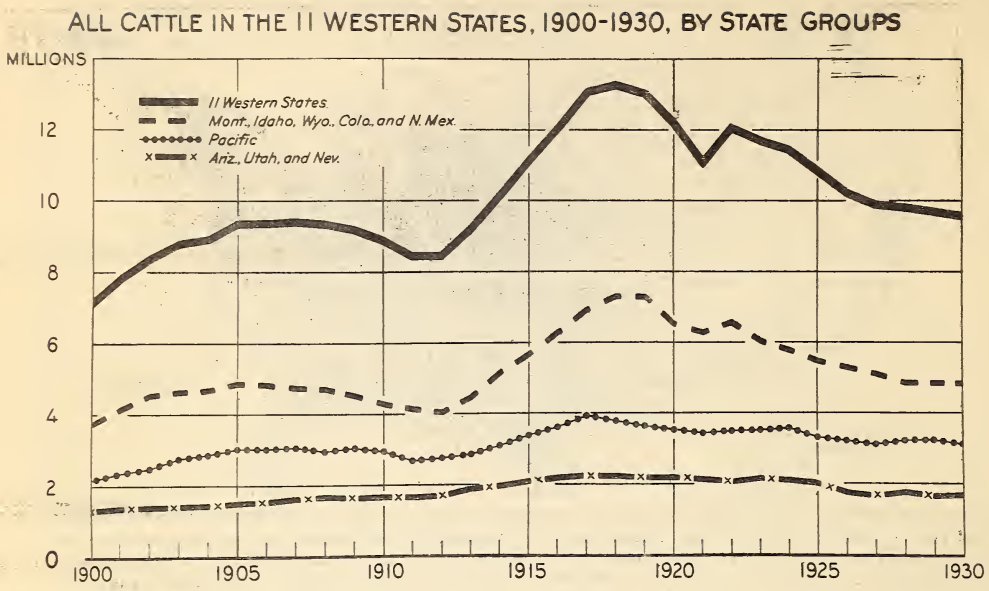

FIGURE 18 - CHANGE IN NUMBER OF CATTLE HAS BEEN MUCH GREATER IN GREAT PLAINS STATES THAN IN OTHER SUBDIVISIONS OF THE REGION. THERE HAS BEEN A DOWNWARD TREND IN NUMBERS OF CATTLE IN ALL PARTS OF THE REGION, SINCE 1918

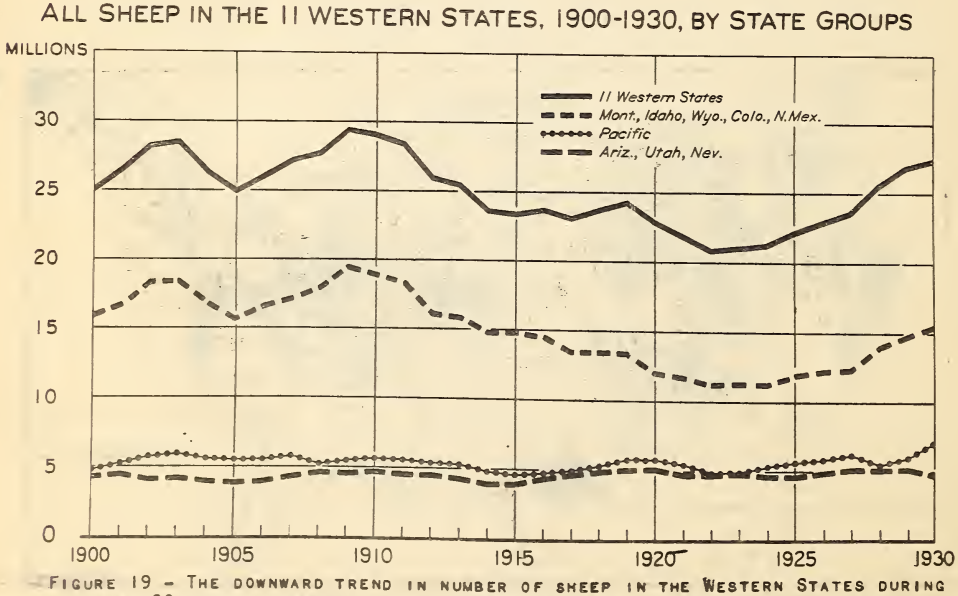

FIGURE 19 - THE DOWNWARD TREND IN NUMBER OF SHEEP IN THE WESTERN STATES DURING THE PAST 30 YEARS IS PRIMARILY DUE TO REDUCTION IN THE GREAT PLAINS STATES. IT IS HERE THAT DRY FARMING HAS MADE ITS GREATEST ADVANCE. SINCE 1922 THE NUMBER OF SHEEP HAS BEEN RISING AND HAS REACHED A POINT AT WHICH PRICES ARE SERIOUSLY AFFECTED

The ups and downs in cattle and sheep may be traced through a series of charts, the first of which is Figure 18, which shows the number of cattle on farms and ranges for this territory by years from 1900 to 1929 for the region as a whole and by sub-divisions. Figure 19 shows similar data for sheep. These charts show that both of these classes of livestock are subject to remarkable changes in the volume of their production. An interesting thing is that the cycles represented tend to move in an inverse way; that is, when sheep are in the ascendency, cattle are in a decline. This reflects a prevailing mode of reaction on the part of ranchers which has its counterpart in similar reactions with the producers of feed crops and livestock in the eastern portion of the country. It is that of going to extremes in shifting their production in response to high and low prices. First there is a period of unusually favorable sheep prices, while cattle prices are not so good. Many go out of cattle and rush into sheep with the inevitable result of an over-supply of sheep and declining prices such as we are having now. Cattle are then the only thing to grow and history repeats itself in terms of that enterprise. Just now the number of cattle is low and the number of sheep is embarassingly large.

This competition is brought out in another way by Figure 20, which shows on the same basis and for the same years the relation of the number of cattle to the number of sheep in terms of animal units, the curves being plotted to show the proportion that sheep made up each year of the total number of animal units in the region. It is obvious that in many areas sheep and cattle are sharp competitors for feed and grazing. The unfortunate part of the situation is that the competitive forces work themselves out so awkwardly and result in such a poor balance between these two classes of livestock. To be sure, the farmers of this region are responsible in only a minor way, particularly with reference to cattle. There is need of a more careful study of the relative demands for the products of these two classes and of a more careful adjustment of thier production not only to these demands but to the resources upon which they are produced.

In many situations there is a supplementary as well as a competitive relation between sheep and cattle. Most profitable utilization of certain grazing lands can be realized only by a combination of sheep and cattle. The Department of Agriculture, in cooperation with several Western States, is trying to determine under what conditions this combined grazing program is most feasible and in what proportions these two classes of livestock should be combined.

The Western livestock man should be particularly interested in the regional competition affecting the industry. Rather fundamental changes are in progress in other parts of the country which will have a significant and probably permanent effect upon the livestock industry here. The exploitation of high yielding grain lands in the Corn and Wheat Belts for two generations or longer is making its effects evident in exhausted fertility and growing difficulty with weeds and plant diseases. This calls for some significant changes in cropping systems. It means first of all a swing toward legume crops to be used for restoring fertility as well as to help in the combatting of weeds and diseases. This inevitably

increases the potential cattle-producing capacity of these lands, already supplying the bulk of the cattle for the country. It means that the range territory may have a less adequate outlet for their stocker and feeder cattle in these regions than they have enjoyed in the past because, more and more, the humid belt farmers are going to grow their own cattle. On the other hand, there is the development already cited - a growing demand for cattle from the ranges to be moved westward to supply meat for the rapidly increasing population in the West Coast cities. Incidentally, developments that have been taking place within the range territory itself are increasing the local demand for meat and thus the local slaughter of livestock.

Dairying: The agricultural changes of the last 30 years which we have been tracing have brought dairying to a position of growing importance in this region. The rapid growth in population has been the primary factor in extending the demand for dairy products which in turn has stimulated the development.

The more intensive phases of dairy production in this region as indicated in Figure 21 are localized on irrigated lands and in the humid valleys, particularly in the coast States. There is a sparse production of cream, destined for butter production in centralizer plants, which characterizes some portions of the dry-farming territory. However, this is an almost negligible development beside the more intensive phase to be found in the Willamette Valley and other areas especially well fitted to dairying. It is to be expected that further development will take place as demand justifies primarily in these favored areas.

Out of 21,063,000 milk cows and heifers on the farm in the United States on January 1, 1929, as estimated by the U. S. Department of Agriculture, the western States had 2,500,000 or 9 per cent. Of heifers one to two years old kept for milk there were estimated to be 4,377,000 in the United States of which this region had 450,000 or 10½ per cent. The number of cows on farms in this region increased 52 per cent between 1909 and 1929. At the same time the total population of the area increased from 6.3 millions to 11.9 million, or 74 per cent. 3/

This remarkable increase in western States population, due primarily to the development of the Pacific Coast cities, has been a saving element in the dairy situation in the western States. The demand for fluid milk has increased probably more rapidly than population and the region itself has a virtual monopoly on the production of this supply, because of the great distances to other dairy-producing regions and the transportation difficulties incidental to that distance and the mountainous territory over which transportation lines run. These same barriers operate with considerable effectiveness, in the case of butter and other dairy products. By way of illustrating this situation it may be cited that in 1929 less than two per cent of the butter received at the wholesale markets of San Francisco came from States outside this region and

3/ Comparison based upon figures from the 1910 Census and preliminary figures recently issued by the Federal Bureau of the Census from the 1930 Census of Population.

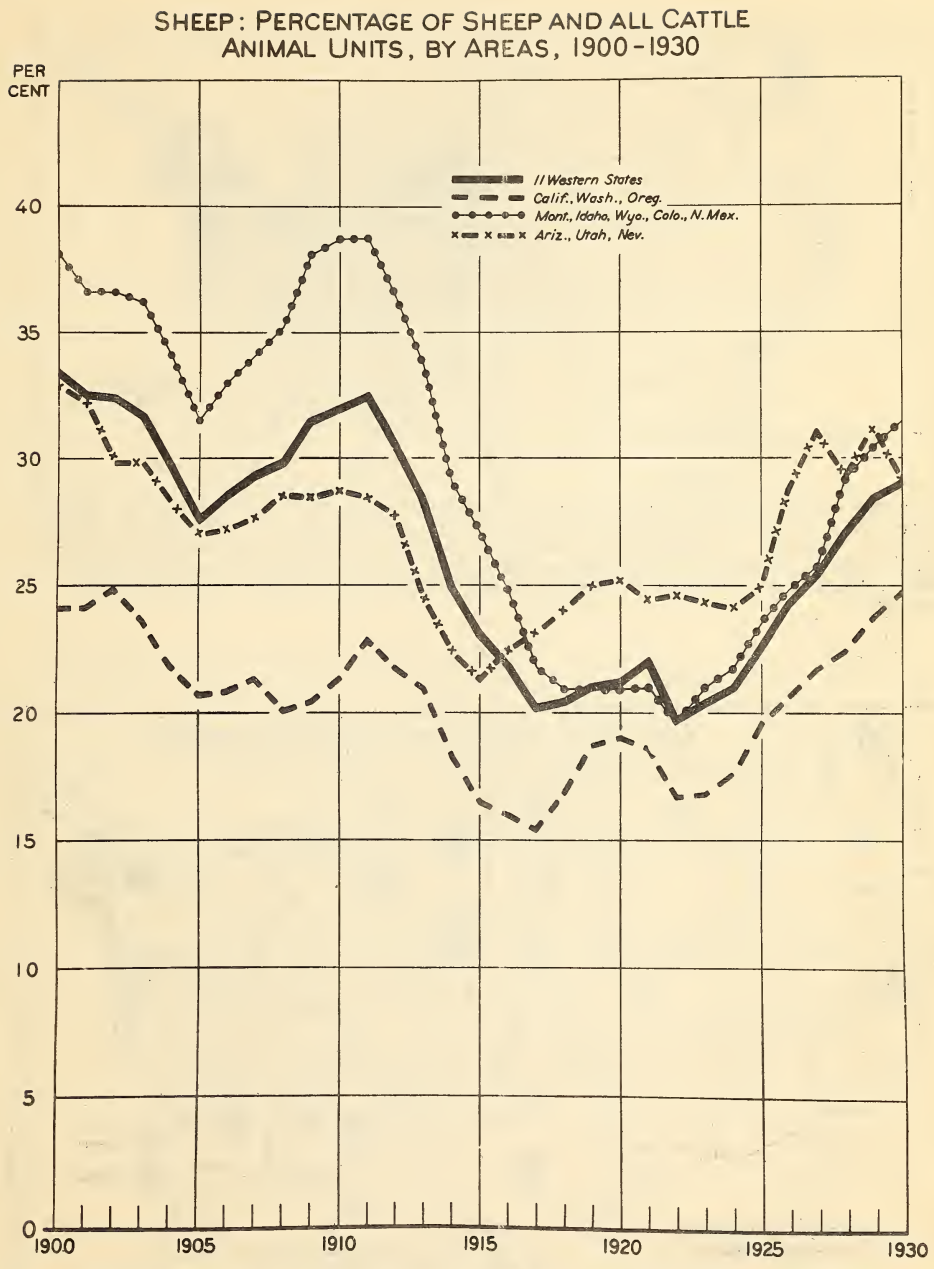

FIGURE 20 - THIS CHART SHOWS THE WAY IN WHICH THE RELATIVE NUMBERS OF SHEEP AND CATTLE IN THIS REGION CHANGE. SHIFTS IN PRODUCTION RATIOS BETWEEN CATTLE AND SHEEP GO TOO FAR AND LEAD TO OVERPRODUCTION OF FIRST ONE AND THEN THE OTHER CLASS OF LIVESTOCK. JUST NOW CATTLE ARE FEW AND SHEEP NUMEROUS, RELATIVELY

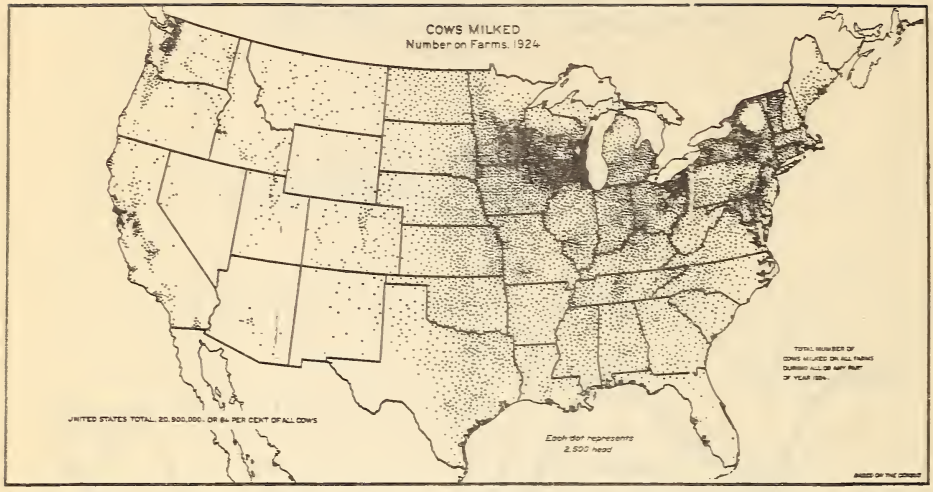

FIGURE 21 - DAIRY COWS ARE TO BE FOUND IN GREATEST NUMBERS IN THE GENERAL PROXIMITY TO CENTERS OF POPULATION. HUMID AREAS NEAR THE COAST AND IRRIGATED TRACTS ARE UTILIZED IN PART FOR THE GROWING OF DAIRY FEEDS. IN SUCH AREAS DAIRYING MUST COMPETE WITH THE MORE INTENSIVE ENTERPRISES SUCH AS FRUIT AND VEGETABLE GROWING

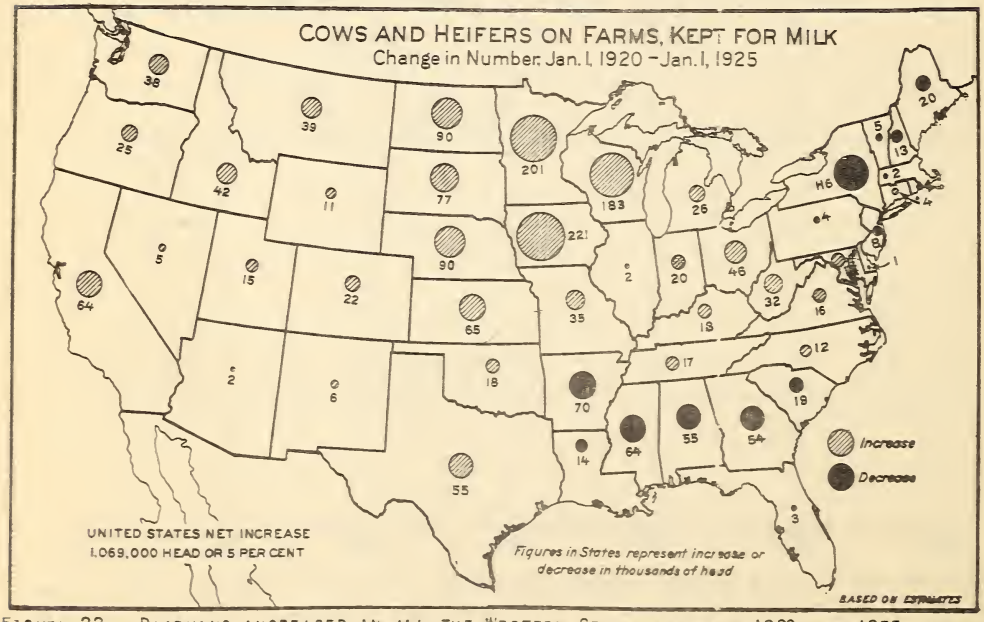

FIGURE 22 - DAIRYING INCREASED IN ALL THE WESTERN STATES BETWEEN 1920 AND 1925, THOUGH NOT SO CONSIDERABLY AS IT DID IN THE UPPER MISSISSIPPI VALLEY. NOTE THE DECREASE IN NUMBER OF COWS IN THE SOUTH AND IN NEW ENGLAND

only 15 per cent of the cheese. Similar receipts at Los Angeles are even more nearly exclusively from this region.

It is remarkable that the dairy industry of this region, shut off from the rest of the United States by transportation conditions, stands in approximately the same quantitative relation to the region's population as does the dairy output for the country as a whole to our total national population. This means that dairying in the region is not in the same position with sugar and other commodities, exposed to the brunt of national and world competition. It seems also that as population expands there can profitably be a corresponding expansion in the dairy output of the region. This should not be interpreted to mean that the region is in a particularly strong competitive position on the national dairy market. As the demand for dairy products in the country as a whole develops there are vast areas in the eastern half of the country that can supply dairy products more effectively and probably more cheaply than they can be produced and shipped from the western States. The older portions of the Wheat Belt, the entire Corn Belt, and considerable portions of the South are potential dairy territory. Furthermore, developments are under way which within the next few years may make a considerable part of this potential production actual. On the basis of a regional surplus of dairy production, therefore, the Western States would not be in a strong position whereas within the limit of the present and probable future needs of the region itself the local dairy industry is in a relatively strong position.

Poultry: The poultry industry is fourth in importance in the United States in terms of its contribution to the gross agricultural income. In the period of 1924 to 1928 it contributed 9.37 per cent. It was exceeded by milk production with 15.57 per cent; hog production with 13.21 per cent; and cotton 11.74 per cent of the total gross agricultural income of the country. In 1924, the last year for which such figures are available from the Federal census, the value of poultry produced on American farms was 419.4 million dollars. The value of eggs in the same year was 571.9 million, or a total of 991.3 million dollars.

Two phases of the poultry industry are represented in the western States, as is true of the country as a whole. The first is farm flock production under which poultry and eggs are produced incidentally to a general or otherwise specialized farming program. The other is the specialized poultry farm itself. This last phase predominates in Western States poultry and egg production. In two important general regions in California, as well as in the Puget Sound area and the Willamette Valley of the Northwest, specialized poultry production holds an outstanding position as shown in Figure 24. Smaller developments of this sort are to be found in limited districts in Utah, Idaho, and other western States.

This region as a whole has 7 per cent of the poultry of the United States and produces 12 per cent of the eggs. Specialized districts send large quantities of poultry to the eastern states markets, such as New York, Boston, and Philadelphia, coming in competition with the products of the specialized poultry farms of the eastern states. To a lesser extent they come in competition also with the very large output of poultry

products from the Middle West. Western eggs compare well in quality with those of the specialized poultry farms near our great eastern cities. The long haul by rail has some deteriorating effect, however, and they reach the eastern markets in a condition not quite up to the best quality of the East. They are, however, superior to those produced in the Middle West from which comes a large proportion of the total egg production of the United States. To a considerable extent the western egg producer has learned to supplement the eastern output seasonally rather than to come into competition with it. The bulk of the receipts in eastern cities from Pacific Coast points arrive during the months of lightest production in the East.

The competitive position of the Pacific Coast in the national market for high quality eggs is fairly favorable. The milder climate enables these farmers to produce eggs during the slack season when the prices are most favorable. Sufficient feedstuffs are produced in this region to supply the industry at feed prices probably on the whole at least as low as those which the eastern specialized poultry producer must pay. However, the western egg producer must reckon, as must the eastern producer, on the growing competition from the Middle West. Here feed prices are at a minimum and the vast output of eggs and poultry is produced as a side line and as incidental to the other lines of production. On the whole, costs are felt less acutely there and serve less as a factor conditioning supply than is true in a specialized district. More recently middlewestern farmers have been paying greater attention to their poultry enterprise and as a result farm flocks are tending to increase in size and the output per hen tends to increase. At the same time, greater attention is being paid to quality. All of these things are likely to contribute to the making of the Middle West a more severe competitor in the field of poultry and egg production than it has been in the past.

SOME ELEMENTS IN THE DOMESTIC AND WORLD AGRICULTURAL SITUATION OF IMPORTANCE TO WESTERN STATES AGRICULTURE

Thus far we have tried to present the status of agriculture in the Western States both in terms of its general picture and with reference to its constituent enterprises; all in the light of its comparative advantage or disadvantage and its competitive relations with the agriculture of the country as a whole. It may be well in closing to discuss briefly some of the elements in the current economic situation of special importance to our American agriculture generally and hence of importance to the agriculture of this region.

In a summary such as is here proposed one thinks first of the present depression in business and what it may mean to the immediate future of the agricultural industry. It is difficult to differentiate between short-time and long-time developments in the present situation. Everyone agrees that we are at or near the trough of the wave in a much accentuated business cycle. The present situation is probably also affected by the operation of more fundamental and longer time forces. It is well, however, to point out that, just as in the crisis of 1920, agri-

cultural commodities have suffered more severely in their price relationships than have non-agricultural commodities. Similarly, in the expected upward movement, we may well expect that staple agricultural commodities, with their inelastic demand, are likely to show a more tardy recovery than will be true of most non-agricultural products.

The length of the depression period of the present cycle and the rapidity of the recovery from the depression are still problematic. All of the evidence goes to show that the present is a major depression and that recovery is likely to be somewhat retarded. It would seem that the present is no time for major expansion either in the form of enlargements of already established farm businesses or in venturing on the organization of new farms.

Among the economic factors less conspicuous and of longer term operation the secular trend or movement of prices is of major significance. Following the World War there was considerable debate as to whether we had reached a permanently higher price level or whether the price level might be expected to duplicate its behavior following the Napoleonic Wars and the Civil War. There were those who believed that, with new banking methods and the abundant supply of gold, we might expect a level or even a rising secular trend in prices. The other school believed that a downward secular trend was inevitable. It is now rather generally believed that the long-time trend of prices is downward. Each succeeding cyclical movement is likely to leave us at a lower point.

Long-time movements in the price level have a very significant meaning for the agricultural industry. First of all, it is questionable whether the non-agricultural industry can enjoy the exuberant prosperity and expansion which seem to characterize a long drawn-out period of rising prices. Whether this is true or not remains to be demonstrated in the decade ahead, but if it should be true it must perforce affect the rate of expansion that is feasible for agriculture.

The long-time price trend will also have considerable influence on what is a most rational policy with reference to farm development. This has primarily to do with the nature and amount of investments in permanent farm improvements. Most of these things, together with the purchases of land, are financed by deferred payments. The farmer is traditionally in the debtor class, and it is the debtor class which suffers most as a result of declining price levels, whether the decline be cyclical or in terms of the secular trend.

Two other considerations of substantial economic importance to agriculture center in the population problem. The one has to do with prevailing and future food habits; the other with the rate of population increase. It seems true that people are eating decidedly less per capita than they were twenty-five years ago. It seems also true that population is expanding at a distinctly lower rate than it was during the period of our earlier national development. Both of these things have an obvious relation to the demand for farm products and thus to the future returns to farming.

Another series of considerations affecting the future of agricultural prosperity is to be found in the domestic and world development of agricultural technique. Thirty years ago students of agriculture were saying that all of the best agricultural land of the world had now been occupied and that at last the world's population would feel the pinch of increasing food scarcity and a rise in the cost of living. The Malthusian doctrine was coming into its own. Agriculture was realizing its natural condition of a scarcity economy. During the last ten years this view of agriculture has received a rude shock. No longer need the industrial element of our population fear a food shortage. Agriculture has suddenly been converted from a scarcity economy to a surplus economy.

How long this condition will last remains to be seen. That it demands far-reaching and thorough-going readjustments throughout all of our agricultural territory is obvious. We should face the cold facts in the case and realize that throughout this country and other countries there are many agricultural acres now in use which can not be expected to support a farming enterprise that will afford a reasonable standard of living to those who are carrying it on. We have already readjusted our idea as to what is marginal and sub-marginal land in agriculture; but the change has come primarily with reference to what we had previously considered sub-marginal. It is hard for us to realize that lands previously super-marginal are now sub-marginal.

It may be a source of gratification for those who are interested in the agriculture of this region to realize that these new developments are tending to move the center of gravity of American agriculture westward. It is within this region and in the States immediately eastward that the most of the transition of lands from a sub-marginal to a super-marginal status has taken place. Nevertheless, in the development of the last 30 years many false starts have been made and much human effort and private capital have been dissipated in this region in attempting to use lands that are too poor to support an adequate agriculture. There is no reason for thinking that this type of experience is entirely a thing of the past. The present situation demands the closest sort of scrutiny in order to determine the comparative advantage under the new conditions of this or that region, area, or farm, in the production of any given combination of farm products. We need as never before a comprehensive program of economic research into the problems of our own agriculture in order that the waste of human effort and capital may be reduced to a minimum and that farm profits may be raised to a point at which adequate living standards may be supported. This is a job to challenge the best efforts of our research and extension forces.

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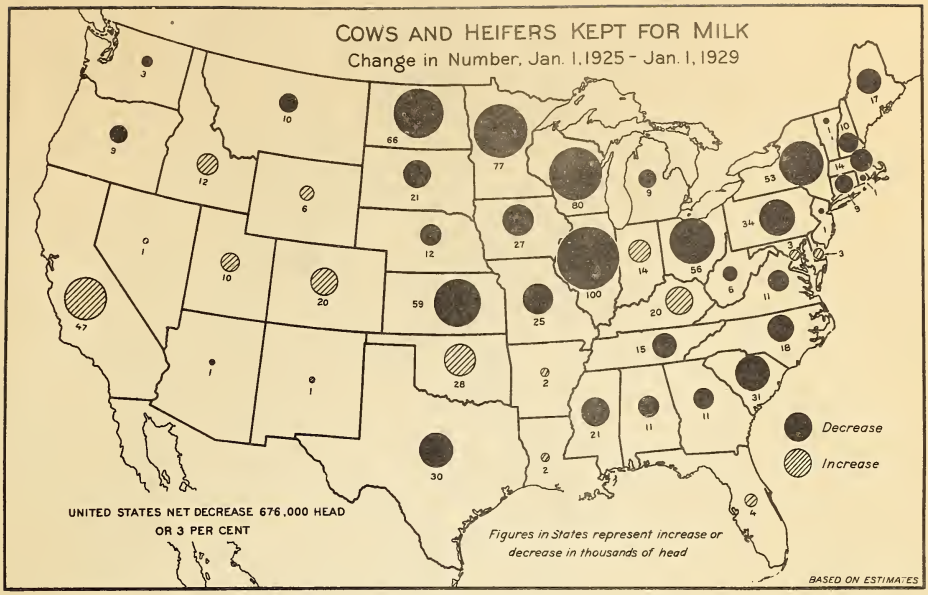

FIGURE 23 - DURING THE LAST FIVE YEARS THE WESTERN STATES HAVE, FOR THE MOST PART, CONTINUED TO INCREASE THE NUMBER OF DAIRY COWS, WHEREAS MOST OF THE REST OF THE COUNTRY SHOWS A DECREASE. THE MOST RECENT FIGURES HOWEVER, SHOW INCREASES IN PRACTICALLY ALL STATES FOR 1930 OVER 1929

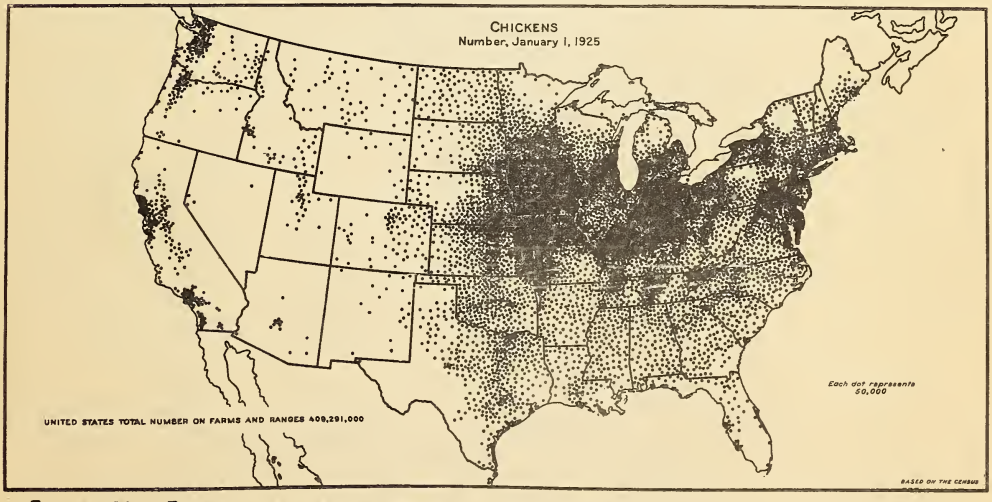

FIGURE 24 - THIS MAP SHOWS THE AREAS OF HEAVY CONCENTRATION OF CHICKENS, MARKING THE LOCATION OF SPECIALIZED EGG PRODUCTION ON A "COMMERCIAL" BASIS. THE INDUSTRY TENDS TO COINCIDE GEOGRAPHICALLY WITH DAIRYING ALTHOUGH THE TWO ENTERPRISES ARE NOT USUALLY COMBINED UNDER SPECIALIZED PRODUCTION UPON THE SAME FARMS

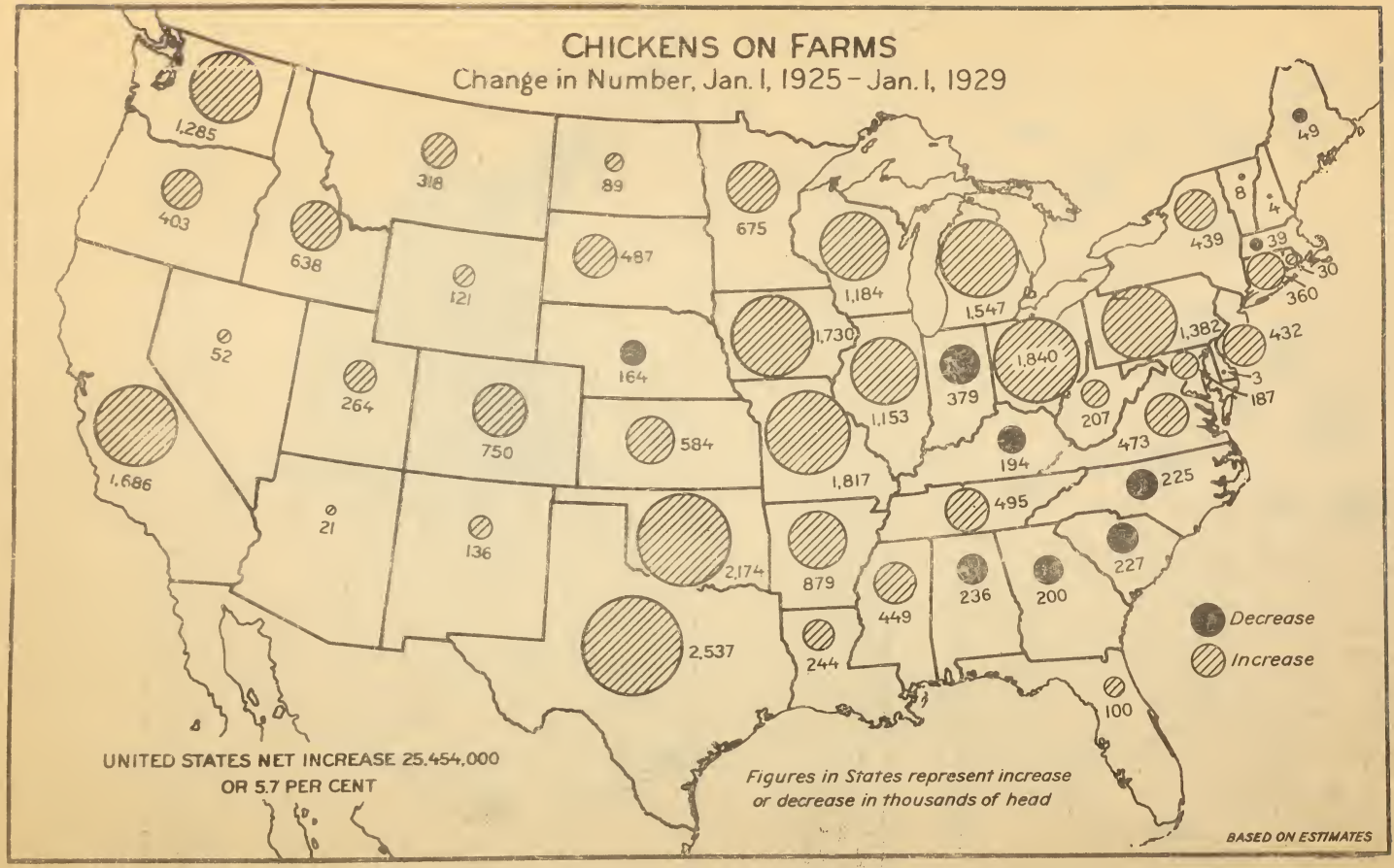

FIGURE 25 – THE POULTRY INDUSTRY HAS BEEN INCREASING SUBSTANTIALLY IN NEARLY ALL PARTS OF THE COUNTRY DURING THE LAST FIVE YEARS. THE WESTERN STATES HAVE SHARED SUBSTANTIALLY IN THIS INCREASE